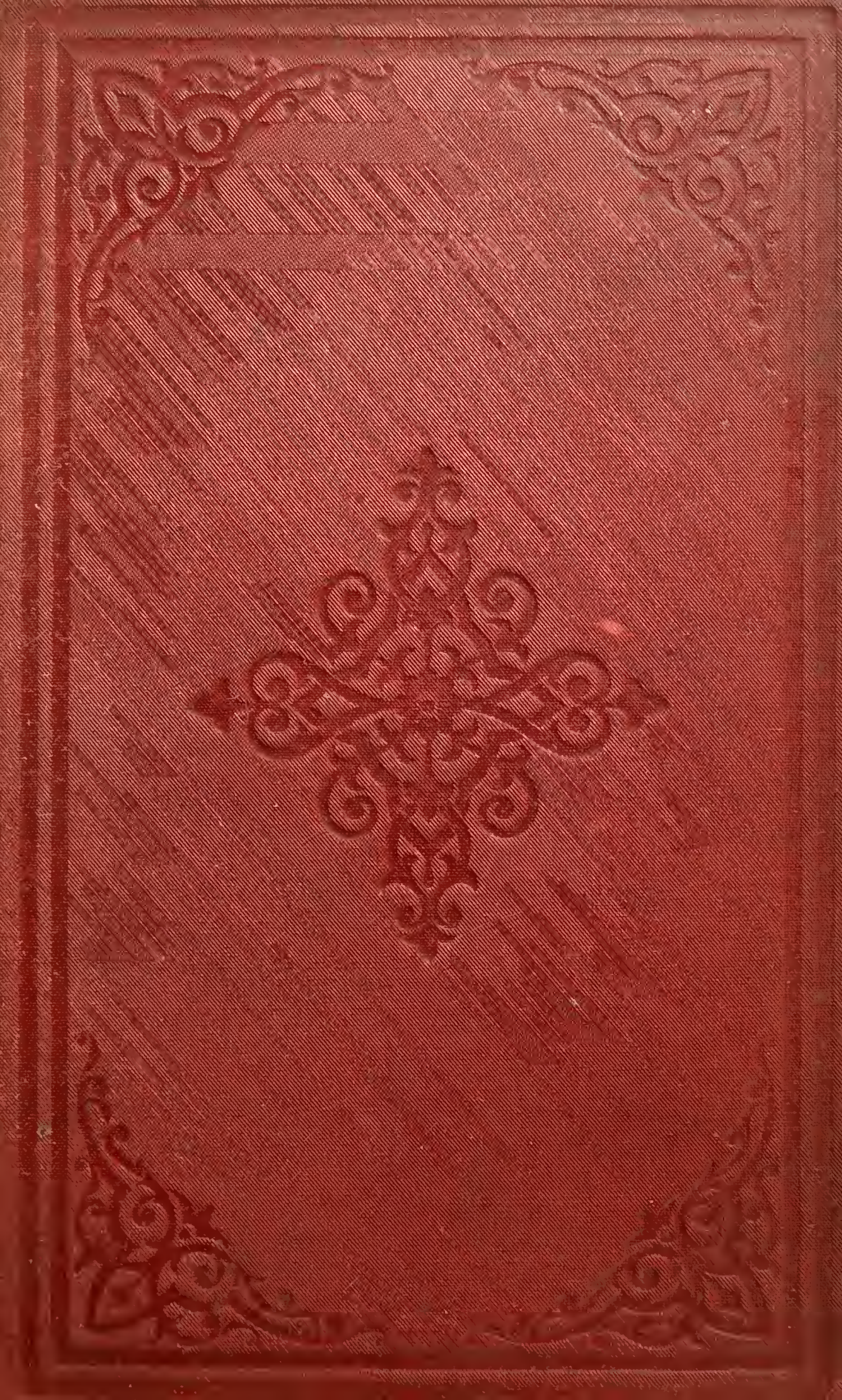

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A TREATISE

ON THE

ART OF BOILING SUGAR,

CRYSTALLIZING, LOZENGE-MAKING, COMFITS,
GUM GOODS, AND OTHER PROCESSES
FOR CONFECTIONERY, ETC.

INCLUDING THE VARIOUS METHODS OF

MANUFACTURING RAW AND REFINED SUGAR GOODS.

BY

HENRY WEATHERLEY.

A NEW AND ENLARGED EDITION

WITH

AN APPENDIX ON

COCOA: ITS VARIETIES AND THEIR CHARACTERISTICS; CHOCOLATE
AND ITS MANUFACTURE, INCLUDING CHOCOLATE CONFECTIONS;
CARAMELS, NOUGATS, MARSHMALLOWS, BURNT ALMONDS,
CANDIED NUTS, AND OTHER CONFECTIONS: COMPRISING
RECEIPTS AND PROCESSES OF MANIPULATION.

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PREFACE.

In presenting to the Confectioners' Trade a new edition of Weatherley's "Art of Sugar Boiling," the Publishers beg to state that the present Editor has added an Appendix in which have been included some of the most popular confections of the day.

Fully recognizing that Chocolates now lead all confections in popularity, a detailed account of Cocoa, and its different varieties and their characteristics has been given, together with its mode of treatment in the production of Chocolate. Then follow the processes of manipulating Chocolate, with a number of receipts for Chocolates, and other leading confections; the whole adding as it is believed greatly to the value of this already useful book, and bringing it up to date.

PHILADELPHIA, *August* 18, 1903.

CONTENTS.

Preface 3
On the Qualities of Sugar 17
On Clarifying Sugar 22
On Colors and Adulteration.................... 24
On the Workshops and Boiling-Rooms.......... 29
Average Degrees of Heat of Drying-Stoves 31
On Hand and Machine Goods 31
On the Degrees of Boiling Sugars, and how to test them 34
On Cutting the Grain, Lowering, Reducing, or Greasing Sugar.......................... 37
On Artificial Fruit Essences, etc., and the Great Exhibition 39
On the Kinds of Goods to make, and how to make them 41
Lemon Acid Drops 42
Lemon Barley Sugar......................... 44
Barley Sugar Drops......................... 45
Honey Drops............................... 46
Pine Apple Drops........................... 47

Burnt Almond Rock or French Rock 47
Cocoa Nut Ice, Cream or Paste 48
Cough Candy 49
Anniseed Drops or Cough Drops.............. 49
Horehound or Montpelier Drops 50
Horehound Candy 50
Red Cocoa Nut Ice.......................... 51
Cocoa Nut Candy........................... 51
Cocoa Nut Hardbake, or Eggs and Bacon 52
Crystallized Cocoa Nut Chips................ 52
Everton Toffee............................. 53
To Ice Cocoa Nut Paste..................... 54
Victoria, Alexandria, and Albert Rocks, etc...... 55
Large Rocks, Strawberry or Raspberry.......... 56
Boiled Sugars in Moulds..................... 56
Boiled Sugars as Medals, etc.................. 57
Imitation Plum Puddings 57
Brandy Balls and Clear Balls.................. 58
Clear Balls 59
Sponge Sugar, or Honey Comb, etc............. 59
Love Rock, or Rock Varieties, etc.............. 60
Crystallized Imitation Ginger................. 61
English Almond Rock........................ 62
Almond Hardbake 62
Clove, Brown Acid, Black Jack, etc............. 63
White Acid, Rose Acid, Sticks, etc.............. 63
Small Bulls' Eyes and Nelson Balls............. 63
Ginger, Lemon, Rose, or Peppermint Candies.... 64

Burnt Almonds 64
Pear Drops, Raspberry Drops, and Rose Drops.. 65
Turkey Sugars, Lemon, Peppermint, and Rose... 66
Farthing and Halfpenny Sticks (clear).......... 66
Farthing and Halfpenny Cushions, Sticks, etc. (pulled) 67
Peppermint, Lemon, Rose, etc., Pastilles or Drops 67
Cherry Stones and Rose Buds.................. 68
Real Burnt Almonds, or French Pralines........ 69
Cherry Balls, Fishes, Tom Thumb Drops, etc.... 70
Imitation Crystallizing 71
Imitation Indian Corn......................... 72
Pink and White Sugar Candy................... 72
Chocolate in Boiled Sugars 73
Ginger Toffee................................. 73
Doncaster Butter Scotch 74
Raspberry Toffee 74
Persian Sherbet 75
On Crystallized Goods, Liqueur Bon-Bons, etc... 76
Liqueur Bon-Bons, etc......................... 77
Liqueur Almonds and Comfits 78
Gum Pastilles, etc............................ 78
Pink or Yellow Jujubes 79
To Crystallize Preserved Fruits 80
To Preserve Fruits Whole in Syrup............. 80
Raspberry Jam 81
Red Currant, Black Currant, and Gooseberry Jam 82
Strawberry Jam 82

Chocolate Ice Cream 122
Coffee Ice Cream 123
Tea Ice Cream 123
Water Ices—Lemon Water Ice 123
Orange Water Ice 124
Strawberry Water Ice 124
Raspberry Water Ice 124
For any of the Currant Water Ices 124
Pine Apple Water Ice 125
To Preserve Oranges or Lemons Whole 125
To Preserve a Pine Apple Whole 126
Orange Quarters in Barley Sugar 126
Paris Nougat 127
Raspberry Syrup 127
Cherry Syrup 128
Apple Paste for Ornamenting, etc 128
Orange and Lemon Chips 129
Cherries in Brandy 129

APPENDIX.

Cocoa, its Varieties and Characteristics 133
Commercial Sorts of Cocoa Beans 135
American Cocoa, Venezuelan and Ecuador Cocoa;
    1. Socomusco 136
2. Esmeraldas from Eucador; Caracas Cocoa; Puerto
    Cabello Cocoa; Ariba Guayaquil Cocoa 137
Machala Guayaquil Cocoa; Surinam Cocoa; Maracaibo
    Cocoa; Berbice Cocoa; Essequibo Cocoa 138

Brazilian Cocoa; Marañon Cocoa; Bahia Cocoa; Cayenne Cocoa; Cuban Cocoa; West Indian Varieties of Cocoa; Haiti or Port au Prince Cocoa.... 139
Trinidad Cocoa; St. Domingo Cocoa; Guatemala Cocoa; Martinique Cocoa; Asiatic Cocoa; Ceylon Cocoa.................................... 140
Java Cocoa; African Cocoa; Cameroon Cocoa 141
Manufacture of Chocolate 142
Cleansing and Sorting the Beans.................. 143
Roasting the Beans.............................. 144
Crushing, Shelling and Cleansing the Roasted Beans. 146
Mixing Different Kinds of Cocoa Beans........... 148
Trituration of the Cocoa Mass 149
The Melangeur 150
Mixing the Ground Cocoa Mass with Sugar and Spices to Produce Chocolate.................. 153
Trituration of Chocolate Mass 154
Levigation of the Chocolate Mass 156
Proportions for Mixing Cocoa Mass, Sugar and Spices; Hygienic Chocolate; Spiced Chocolate .. 158
Spanish Spiced Chocolate; Vanilla Chocolate 159
Coloring Materials 160
Removal of Air and Division of the Chocolate...... 161
Moulding Chocolate 162
Chocolate and Other Confections: Chocolate Cigars.. 163
Chocolate Eggs; Various Figures, Fruit, Animals and Other Small Objects; Small Sticks, Tablets, Fruit or Figures Filled with Cream; Shaking Table 164

Chocolate Lozenges and Pastilles 166
Sweet Chocolate 167
Cream for Chocolate Creams or Bars; Chocolate Cream Roll 168
Chocolate Cream Bars; Moulded Chocolate Cream Bars 169
Nougatines 170
Chocolate Nougatinct; Chocolate Cream Drops 171
Chocolate for Dipping 173
Caramels: Chocolate Caramels 173
Vanilla Caramels 174
Raspberry Caramels; Cocoanut Caramels 175
Maple Caramels; Walnut Caramels 176
Candies: Cream Candies 176
Walnut Cream Candy 177
Cherry Cream Candy; Indian Cream Candy 178
Cream Chips 179
Cream Candy (White); Candy Pulling 180
Molasses Candy; "Yellow Jack;" Walnut Molasses Candy 181
Peanut Candy; Honeycomb or Sponge Candy; Molasses Cocoanut 182
Transparent Molasses Candy; Butter Scotch; Fruit Candy 183
To Blanch Almonds; Peppermint Candy; Plaited Peppermint Candy 184
Nougats: Nougat 185
Vanilla Nougat 186
Marshmallows: Marshmallows; Opera Cream Caramels 187

Burnt Almonds 188
Candied Nuts 189
Fondants: Fondant Cream for Centres; Fondants for Mixtures 190
Parisian Chocolate Bonbons; Burnt Almond Chocolate 191
Index 193

ON THE

ART OF BOILING SUGAR.

AND VARIOUS OTHER PROCESSES

IN SUGAR GOODS Etc.

On the Qualities of Sugar.

It is necessary, before we proceed in the work, to speak of the material used, the nature and qualities of which are of very great importance to those engaged in this branch of the trade, and who work it into such a variety of confections, a term derived from the Latin, *con* and *facere* (that is to "make up"). In the earliest records of the Sugar Cane the produce was assimilated and treated as Honey, for an ancient historian, in writing of a certain people, says they have Bees which make Honey but the "Confectioners" make much more It will be superfluous here to enter into the history of the sugar cane, the processes it undergoes, etc.: however interesting it might be, it would exceed the limits of a work of this kind. The best description of sugar for the purposes of the Confectioner are those from the West Indies, and an acquaintance with the qualities of raw sugars is of equal importance to persons using them for domestic purposes, who in buying are so often led away by that most deceptive bait "color," which is seldom an advantage except when taken from an original hogshead. Moist sugars, as sometimes sold retail, are so sophisticated and artificially treated for appearance sake that a very large amount of the pure saccharine matter is entirely destroyed or lost to the consumer. We find the public at fault here: the grocers are compelled to make up their sugars to please the eye, and as it is a leading article they are great losers from competition, supposing they study quality, except the darkest foots, so called from its receiving the drainage or moisture from the other portion of sugar in the hogshead while in a horizontal position during the voyage nearly all the West India raws are good enough for domestic purposes. During the high prices, some years since, sugar from potatoe starch was used largely for adulteration; and, though an excellent imitation, there is very little sweetness, and it can be detected with Iodine, which changes the color when mixed with water. All artificial sugars, if they may be so termed, including beet-root sugar, made extensively in France, are quite useless to the workman: they possess neither strength nor richness, and, if mixed with cane sugars, they annoy him by puffing and burning in the pan, before they are half up to the degree he requires; besides the loss of time and annoyance in using sugars of a low class, there is a greater waste in boiling than many are aware of. In choosing raw sugars, prefer those that have a gray cast in preference to yellow for boiling; they should be free and sparkling in the grain and smell sweet; this is a necessary test in all sugars, particularly those in bags: avoid those that feel sticky in the hand

and hang together when pressed—they are weak and will not boil well. Some bag sugars are cheaper, and, if sound, are useful for low-class goods; they, however, require caution in buying, as some kinds are very deceptive to the boiler. Mauritius work well, and those of good qualities answer nearly all purposes. Since the reduction in prices of refined sugars, East India for boiling is nearly superseded, but when clarified, is very useful for sugar sticks, etc., from the great tenacity of the grain in pulling out. A great many of these sugars smell very badly and require to be tested, or during the evaporation in boiling they will be extremely disagreeable. With regard to refined sugars of English make, whether in lumps or loaves, they generally possess quality enough for all ordinary purposes, except for best goods and crystallizing, when color is necessary, combined with hard, close texture, and brilliant appearance. Some few years since large quantities of Dutch Refines were introduced in the market of very inferior quality, and badly made in every respect. They should never be used while English Refines keep at any thing like their present prices. Crushed lump boils well, and answers every purpose of lump or loaves for inferior bottled and other goods. About fifteen years since, when sugar was dear in England, a remarkable system was carried out by several confectioners, to obtain it cheaper by their establishing factories in the Channel Islands, and making up refined sugars, which in those places were very cheap, into various shapes in dry goods without acids or flavorings, and sending them in barrels over to their correspondents in England to be remelted. There was no duty at that period upon these manufactured sweets, but this manifest injustice to the rest of the trade, whom these clever schemers very much undersold, was brought to the notice of the Government, and a duty of 6d. per lb. soon put an end to these questionable transactions.

On Clarifying Sugar.

As it is both convenient and necessary under some circumstances to clarify sugar, the processes are given below. The low prices at which refined sugars have been sold for some time past does away with the necessity of clarifying Raw Sugars; but if it should be required, for 56 lbs. of sugar, take the whites of six eggs, with a quart of water, into your pan, and whisk them thoroughly; add 4 lbs. of charcoal in powder, and two and half gallons of water; dissolve the whole; it must be watched while on the stove until it boils; so soon as that takes place pull it on one side and let it remain a short time to settle, take the scum off, and place the syrup half over the stove again as it must not boil violently; as the scum accumulates take it off, and during the time it continues to rise throw in several half pints of cold water, which assists in bringing it up; it must afterwards be passed through a large jelly bag, and returned until it becomes bright, as it will be black at first. The above process is for dark colored sugars, for those lighter in color use less charcoal; some in the trade use bullock's blood instead of charcoal, but it is more difficult to obtain in most places, besides being unpleasant to use. If loaf sugar is required to be clarified, take the whites of six eggs well beat up with a whisk, to the same quantity, unless very dark in color, when a third of the charcoal may be used, as in the last process, and proceed the same. These syrups ought not to be more than 32 degrees by Beaumes Saccharometer, or 212 by the Thermometer. The scums can be washed in water and passed through the bag for the next clearings. Clarified sugars must not be allowed to remain for an indefinite time before being used, the action of the atmosphere causing them to boil weak and windy. The pans used in clarifying must be one-third larger than the bulk of sugar takes up, to allow for the sudden rising of the scum; it is indispensable that all the pans used either for boiling sugar or for clarifying syrups be made of either copper or bell metal· if large sizes are required for clarifying, the sides may be of block tin and the bottom copper; for gum goods and similar substances, the steam pans or others should be glazed or tinned, supposing them to be made of copper.

On Colors and Adulteration.

It is to be hoped that every manufacturing confectioner, who went to the International Exhibition, 1862, saw Dr. Hassall's large case of *adulterated* articles, used as food, and henceforth determined to discard all mineral colors, and adulterated compounds, from his workshop; those that missed this interesting collection, may be told that it consisted of every conceivable article, used or consumed as food, bought indiscriminately at shops, in various parts of London, and nearly every trader who saw it found articles he dealt in represented there: but in respect to this trade, adulterated lozenges of all kinds abounded, mixtures colored with crome, and sugar goods with vermilion, red lead, etc. Names of parties were not revealed, but it was a wholesome lesson to all interested; and it ought to be known in the trade generally that the "Adulteration of Foods Act," passed not long since, contains very stringent clauses, as regards using any deleterious matter, or compound, in coloring or mixing, etc. Ignorance cannot be urged on the part of those in the trade, who now use poisonous mineral colors, in sweets, or other goods, when every color that can possibly be required can be obtained, in which no pernicious qualities exist

A list of harmless coloring materials for the confectioner's use will be found in the Appendix, p. 160.

In the regulations, established by the Minister of Commerce for the guidance of the French Confectioners, the following are the only colors allowed, and are all that are necessary to the English Confectioner: (Blues), Indigo, Prussian Blue, Ultramarine. (Reds), Cochineal, Carmine, Carmine lake. (Yellows), Saffron, French Berries, and Turmeric or Fustic. (Greens), by mixing the yellows and blues. In allowing ultramarine to be used, it must not be thought or understood to be the description of blue sold under that name, "of German Manufacture," which is very unwholesome. The best color from cochineal we have made is as follows: ¼ lb. powdered cochineal, 2 ounces washing soda, "bruised," 2 ounces rock alum, "bruised," ¼ lb. cream of tartar, put 3 pints of water in a copper pan, add the soda and cochineal; when it has boiled, add the alum, gradually, or it will flow over, keep stirring till it is dissolved, and boil up again; then add the cream of tartar, boil two or three minutes longer, and strain through a small hair sieve for use; these quantities can be reduced in the same ratio if required. No utensil of tin or iron must be used with this receipt or it will give a purple cast to the color. If desired, some of this liquor can be dried down, by evaporation, to a paste, and used on the slab; the only advantage in this is for stripes, or casings, and saving the pans. Saffron as a yellow for best goods cannot be equalled, and is best kept with spirits, but water for small quantities, answers the same purpose. A remarkable substitute for this article is a solution of logwood chips, made the same as strong tea, but it will only act when fresh and the sugar is reduced either by cream of tartar, or one of the acids, used to cut the grain, and which is a great recommendation, as it instantly detects the omission, by turning the boil a dirty color, which when discovered, the lowering can be added in solution, and it instantly changes bright. The very high price of Saffron has made this a valuable discovery for cheap goods, while it is equally as wholesome to use. Indigo, dissolved with sulphuric acid, makes a fine blue, one ounce in powder to a quarter of pound of vitriol, it must be mixed in a jar or pot holding about a pint, and must not be put to any syrups while on the fire. Carmine, though highly prized as a color by the trade, is most generally bought. The process of making is simple, but troublesome, and not suited to the present work. If for any purpose a variety of colors is desired, use the following: Purple

(Cochineal and weak liquid blue)—Orange, (Yellow with Red)—Green (Blue and Yellow.) It will greatly accelerate the work, and be much more convenient, to keep colors for stripes and casings ready for use; they ought (with the exception of cochineal, saffron, etc,) to be worked with the palate knife, with some sweet salad oil on a piece of stone, into a paste and kept for use in jelly pots. Where clear casings are required, of a different color from the original boil, keep some in the pan for the purpose of mixing in cochineal, etc. Mind it is strong, and does not require boiling in more than a minute or so, or the sugar will become very weak. Some prefer doing this on the slab, but for many goods it does not look so well. Keep a roller handy to make your casing even and regular. Should you find it does not adhere properly to your pulled sugar, wipe it over with a damp cloth, or you can even wet it with your hand slightly, the heat in the body of the pulled sugar drying it.

On the Workshops and Boiling Rooms.

At the Great Gun Trophy, in the International Exhibition, was displayed in large letters, "A workman is known by his chips." To carry the *simile* a little further, we may say that a workman is known by his tools, or his workroom. I am sorry to say that very little attention, unless by large firms, is paid to this matter, by a great portion of the trade in sugar boiling. The places in which it is carried on are small, confined, and dark, often underground, and sufficient attention is not paid to ventilation and cleanliness. In this respect they are situated much like the bakehouses in London, but which the legislature has taken in hand, and a new law compels masters to whitewash and paint them at certain periods; a determination to have this done in our trade would render the workmen much more comfortable. In fitting up a boiling room well, instead of having stone, slate, or marble slabs for pouring on, they ought to be cast iron, about an inch thick at least. They are not very expensive, and should be smooth. They save their expense in oil; the size should be regulated, of course, by the size of the room. There is a great saving of time, and great comfort, in the work. There is no sticking to the slab, and they can be worked on any length of time without trouble. Stoves, also of iron, can be built by the regular oven builders, but the slabs can be had at any iron foundry or engineer's. Boiling pans ought to be made specially for brown goods; if made a quarter of an inch thick at bottom, they save a deal of time. For loaf goods the usual thickness will do. Irons for the pouring slab about half an inch thick and three feet long and some half that length are required. Large and small scales for weighing the sugar, acids, etc., ought to be conveniently fixed; also a graduated glass for measuring essences, etc., where boiling is carried on to any extent. With regard to fuel, that is a matter of convenience. Coke is the cleanest, but coals much more healthy to work over; the large amount of carbonic acid rising from coke or charcoal is very deleterious in badly-ventilated places, although in Australia I have known a very large trade carried on, and no other fuel than charcoal could be obtained to manufacture with, but there was good ventilation and the work was well paid for.

Average degrees of heat of Drying Stoves.

The heat of the stove must be regulated to some extent according to the goods placed there. For lozenges, comfits, etc., 80 degrees; sugar candies, 100; for liqueurs before crystallizing, 100; when drained, 80; to dry fruits, etc., 90. It must be observed that one part of a drying-room will be hotter than another, if heated by a stove; steam pipes carried round give the most regular heat.

On Hand and Machine Goods.

Though machines, coupled with the low price of sugars, have created quite a revolution in the wholesale trade of late years, as regards prices and amount of trade done, there are still some who make a great many goods by hand. These require more labor and more care in making, but the competition keeps them to about the same price, and therefore there is no advantage, except for variety and the credit which arises from their skilful manipulation; for there are certain latent properties in boiled sugars (when pulled, for instance) which are only brought out when made by hand, and by a clever workman. This is illustrated in a striking manner by the "Rock varieties," as they are termed; also the beautiful variety of rocks and sticks, both striped and plain, made by some in the trade. No amount of written instruction can perfect the reader in hand-made goods—nothing but practice, and a good deal of it, can do that—but a few practical remarks may assist him. In the first place, a warm slab is indispensable, and great care must be taken that the boil does not go beyond the crack for sticks, but rather less for some, also to keep it well together, after turned out; if the sides get hard and lumpy, it will never recover, and nothing is more annoy-ing or looks worse. When the sugar is about ready to work, and before you stripe it, begin by doubling it in half-a-dozen times, it causes greater tenacity and uniformity in pulling out; look to the pieces for stripes; keep them of a mellow heat, and if they are greasy, damp them slightly when you use them. The same remarks apply to pulled sugar sticks, etc.; great care is required not to let the sugar get too cold at the edges, before turned in; also in looking after the pieces for striping, that they are kept warm; for these goods the sugar ought to be pulled as soon as it can be handled, they should have a silky appearance, which depends to a great extent on the pulling, but also on the boiling. Pulled goods, where the sugar has been boiled too low, will look as dull as putty, and work badly. It was a common thing formerly to put a piece of butter about the size of a nut into all boils of pulled sugars, or oil into barley sugars, etc., but we regard it an old woman's practice, and quite unnecessary for all loaf goods. After the degree of "ball," mind there is a fierce strong fire (and on the contrary for raw sugar goods); it will spoil the color and weaken the quality of any loaf sugar goods to be coddled on the stove.

On the degrees of boiling Sugars, and how to test them.

The number and division of these degrees vary. Foreign confectioners engaged in a superior class of goods, make about 10 or 12 the maximum, and for some class of fine crystals, sugar must be tested to a scientific nicety; but for any purpose the sugar boiler requires half the number are sufficient, and the object of this work being to assist and instruct the workman, and not confuse him, we will name those only that are found necessary: these are the Smooth, the Thread, the Blow or Feather, the Ball, the Crack, the Caramel. We will now proceed to show how to test them:

1st. Smooth, or 215 degrees by thermometer; for example, take seven pounds of loaf sugar, to which put three pints of water; soon as it boils, see that the lumps are all dissolved, if not, break them; let it boil for ten minutes or so, dip into it the handle of a teaspoon, draw it between the forefinger and thumb. If on working them together they feel slippery, that is the first degree or smooth. Clarified sugar is the best for these examples.

2nd. Thread, or 230 by thermometer. In the course of a few minutes the sugar passes into this degree; having soaked the previous sugar off the spoon, try the boil again, close your finger and thumb together, and gently lift or part them, when if you perceive a thread-like appearance between them, it has passed into this degree.

3rd. Blow or Feather, 235 degrees. In two or three minutes from the last, sugar passes into this degree; dip a small skimmer or slice, with holes in it, into the sugar, drain it off quickly, and blow hard through them, you will perceive bladders and feathery particles pass away. This is the blow, or feather; a very useful degree.

4th. The Ball. or 240 degrees. About the same time as the last this degree arrives; have some cold water handy. Take a little sugar out of the pan with the handle of the spoon dip it into the water, and if it is tough and you can work it about with your finger and thumb like a pinch of hot bread, that is the ball.

5th. Crack, or 252 degrees. The same process in testing as the last, but you must be very expert. Take a little out of the pan, put it into cold water, when it will crack; or slip it off quickly, and bite it well. If it crunches and leaves the teeth without sticking to them, pour the sugar out instantly on your slab. This is the most useful degree to the hard confectioner.

N.B.—In trying this degree, unless an experienced workman, the pan must be lifted off the fire.

6th. Caramel, or 260 degrees. It is not necessary to try this degree in the same way as the last; the instant the sugar changes color, which must be closely watched, as it occurs rapidly, it must be poured out, or if not required on the slab, but for other purposes such as spinning sugar, etc., place it in a tub of cold water, the size of the bottom of the pan, to stop the heat or it will turn very dark. The rapidity of these degrees changing into each other of course depends upon the heat of the stove; no definite time can be given. As all loaf goods must be boiled on a sharp fire, they require close watching.

In all the degrees from the thread, the apprentice or learner should accustom himself to try the sugar with his first or second finger and thumb in this manner: first dip them in your bowl of cold water and instantly snatch a small portion from the boil and return it to the water; it is the quickest and best method, and with perseverance can easily be acquired, although we must confess a great many do not care to adopt it for fear of being burned.

On "Cutting the Grain," Lowering, Reducing, or Greasing Sugar.

Each of these terms has been employed to express one and the same meaning, and we have known all used but the last, which we do not think at all inappropriate. It is, however, not important what we call a method, if we adopt a good one, and which answers the purpose and there have been as many tried for this as there are names to express it: vinegar, lemon juice, tartaric acid, sulphuric acid, pyroligneous acid, cream of tartar, etc., etc.; each have been, and can be used, but they require different degrees of care in using, or the goods will be spoiled or not keep. Cream of tartar, though more expensive, is the safest, and the result more safely depended on; next to that wood vinegar or the pyroligneous acid or lemon-juice: the others require no remark, as there is no advantage in adopting them. As a rule, put about a quarter of an ounce, not less, of the cream of tartar to a seven pound boil, a teaspoonful of the strong acids, or table-spoonful of lemon-juice or the common house vinegar to the same quantity of loaf sugar to reduce its strength. With regard to the reasons why refined sugars for the hard confectioner's purpose require to be treated in this way, it may be simply stated, that during the process of evaporation, this sugar exhibits a strong determination, so to speak, to return to its original state of crystallization, and will speedily do so when boiled beyond the degree of the "feather," unless we lessen or reduce its strength, which we do chemically, by bringing into contact with it an acid, which, in its action, is so totally opposed to this process, that according to the expression it "cuts the grain," and prevents them being held together, by what the learned in chemistry would call the "attraction of cohesion."

On Artificial Fruit Essences, etc., and the Great Exhibition.

Although a few only of the leading flavors are named in this book, there are a great variety of the above, and they can be used in many forms, either as simple or compound flavorings, and are likely yet to give rise to many new and curious combinations, both in sugar and other goods, in the hands of a clever inventive workmen: they may be ranked among the most remarkable triumphs of chemical art, for their wonderful similarity to the fruits produced by nature, as regards delicacy of flavors. Artificial fruit essences of the finest quality and producing the nearest resemblance to the names they bear are now manufactured and sold by a number of reliable firms. They were first brought prominently before the public, in connection with confectionery by the author, who had a large display of various designs in boiled sugars at the Great Exhibition, 1851, and received the awards of a Medal, and a Certificate of Honorable Mention for them. For this success he was greatly indebted to the fruit essences, essential oils, etc , used in the manufacture of the goods which were supplied by a prominent firm, and which were tested by scientific men connected with the jurors. Amongst the goods were many new designs in the forms of natural fruits, machines for which have ever since continued to be used by the trade. At the same time, in another class, the currant and fruit dressing machine was exhibited, for which the author also received a medal. A model of this machine is now in the Kensington Museum of Patents (No. 80, in the catalogue), it has met with great approval and success, and continues in use to the present time, amongst grocers and others, using or selling these fruits.

The author therefore refers with some satisfaction to a recent speech on invention, by a great living statesman, from which the following is an extract: "There are three regions given to man for the exercise of his faculties in the production of objects and the performance of acts, conducive to civilization and to the ordinary uses of life: of these, one is the homely sphere of simple utility."

On the kind of Goods to make and how to make them.

Any description of the soft rich eating candies called "Creams" which are of recent introduction under the name of almond, orange, lemon Italian, marmalade, etc. though considered by some a difficult and secret process, can be made by attention to the following: Take for example seven pounds of refined sugar (for white creams use the best); put a quarter of an ounce of cream of tartar, and three pints of water, boil it to the thread or 230 degrees by the thermometer, then take it off the stove, and let it stand aside about half-an-hour, to dispel the heat; then with your spatula, work the syrup against the sides of the pan, thoroughly well, until it changes into a thick creamy looking substance, or "soft grain;" when it arrives at this state, you can add to it, and mix in any kind of fruit essence, with a little acid, or fruit, preserves, almonds, marmalades, etc., etc., according to fancy, and put it into tin frames or shapes, to set, which must be previously oiled with the best salad oil: when cold turn it out.

Lemon Acid Drops.

These drops are now mostly made white: they have continued a great favorite with the public ever since sugar boiling as a trade began;

when they were sold at 2s. per pound, wholesale price, they were made with citric acid and were much better in flavor than those made now with tartaric acid, and nothing but price ought to prevent the former being always used in confectionery: to make a superior article, the best refined sugar should be used. Some houses tinge the boil with saffron, which gives a nice cast, and more in accordance with the name, but this cannot be done with proper effect, without the sugar is a good color. To make them, take a clean bright pan, into which put seven pounds of sugar, quarter of an ounce of cream of tartar, and 3 pints of water, place it on a clear bright fire, stir it about; after it boils, take the pan off the fire, and with the spatula break the lumps (clarified sugar saves this trouble), put it on again, cover the pan over for five minutes, with a cover the proper size; take the cover off after this time, and boil to a crack (in winter rather less), pour out on an oiled slab, with irons round it; when about the consistence of stiff dough, work in three quarters of an ounce of powdered acid (some like a little more) and half a teaspoonful of essence of lemon; when a little colder pass it through the machine; when quite cold, break them up, and sift them in a coarse sieve.

Lemon Barley Sugar.

This is also one of the oldest sweets made; this and acid drops were formerly the only boiled sweets that the old city houses made. "Tringhams," on Holborn-hill, now "Moores," used to be a very great attraction thirty years ago, to see the barley sugar made in the shop; the pouring slabs were marble, slightly concave, or hollowed out, instead of using irons on a level slab; as its name implies, it was said to be made with a decoction of barley, but of that there is no record. Some boil this article to what is termed "color," that is, caramel degree, but unless the workman is extremely careful he will spoil it. As we have before remarked, the only use there can be in boiling to this degree is to keep goods clear, for when placed in air-tight bottles they will keep so for a long period. To make barley sugar, proceed as in acid drops—clarified sugar is the best—add a teaspoonful of strong saffron water, and when up to the crack, pour over the boil a teaspoonful of essence of lemon, let it boil two or three seconds longer, and quickly pour it into the irons on the oiled slab, the irons must be regulated to the size required; run the blade of a knife along the side to keep the rough edges down; as the sides cool, cut off strips, and twist them. The slab must be warm before being used for this article, and to make it very bright and keep its color, it should be boiled as near to the caramel as possible without reaching that degree, therefore to do so keep it on the stove about a second beyond the crack. There is also a machine to pass this through which saves the trouble of cutting, and twisting it.

Barley Sugar Drops.

These are made precisely as the last, except when at the crack pour it out, and when cold enough, as described in acid drops, pass through the machine. Before the use of machines they were dropped from a small pan with a lip to it, on to sifted sugar, either on the slab or paper.

Honey Drops.

When the author first invented these drops, he registered them, and they were made in the form of a bee-hive. When at two or three degrees beyond the crack, a ladle of honey was put into the boil, allowing two or three seconds for this to become incorporated with the sugar, which it reduces again to the crack, it was instantly poured out, or would become dark, honey being very weakening to boiled sugars. They are now made throughout the trade in the same manner as Barley Sugar Drops, with the exception that instead of essence of lemon, a combination of flavors is used, made by mixing together such as rose, pine, raspberry, vanilla, etc., add a few drops with about half an ounce of acid, work it into the mass of sugar, and pass it through the machine.

Pine Apple Drops.

These are made precisely as the last, in every way except essence of pine apple being used, in the place of the other essences, and passed through a different machine.

Burnt Almond Rock or French Rock.

Prepare the same quantity of sugar as in the previous receipts, but put half the quantity more of cream of tartar into it, boil up to the crack. Before this is done have ready blanched and well dried, three pounds of Barbary or Valencia almonds, keep them warm, and when the sugar is up to the degree stated, put the almonds in; the oil from the almonds will reduce the sugar to below the crack, to which it must be brought up again; stir the mass with a small iron or copper rod, but only one way; keep an iron plate half way across the fire, or it will be too fierce for this operation. If the almonds have not been well dried in an oven or by the stove, it will be difficult to get it up to the degree required, and it will be very dark. When at the crack pour it out, as in Barley Sugar, or in iron frames, any shape.

Cocoa Nut Ice, Cream, or Paste.

For white, take seven pounds best loaf sugar, to which put the quantity of cream of tartar used in the previous boils, three pints of water, and boil to the degree of "blow or feather," or 235 by thermometer, but previous to which have all ready prepared, two good sized cocoa nuts, the skin peeled off, which can be done best with a "spoke shave," and either rubbed through a large coarse grater, or passed through the machine made for the purpose, to be obtained from the author. When the sugar is done rub it against the sides of the pan well, with a palate knife or spatula until the sugar becomes very thick or creamy, stir in the cocoa nut, and pour it out quickly in your tin frames, or on the slab within irons. A little essence of lemon very much improves the above.

NOTE.—The object in putting "cream of tartar" to the above and other creams which are given in this book is to prevent too much graining, and to make the goods keep soft and eat rich.

Cough Candy.

The article sold under this name is not a candy, but made in the following manner: Boil the previous quantities of loaf sugar, water and cream of tartar, to the crack, color yellow with saffron, pour it out, and when half cold, mix in half an ounce of acid, a teaspoonful of anniseed, and two drops of peppermint; pull it out continually about half a yard, and return it, until it looks like satin, when you proceed to pull it out in strips, the width of ribbon, and when half cold twist it slightly. The peppermint was originally put in to disguise the flavor.

Anniseed Drops, or Cough Drops.

These are boiled the same and flavored also as the last without the peppermint, either brown or loaf sugar, according to fancy, and passed through a machine, either the acid or other kind.

Horehound or Montpellier Drops.

Exactly as the last, except flavor, with half a pint of strong decoction of horehound put to the sugar with the water; when done pass it through the acid drop machine.

Horehound Candy.

Put half a pint of decoction of horehound with the water, to seven pounds of brown sugar, boil to the feather, or 235 degrees, stir it against the sides of the pan, with the spatula, two or three minutes, then stir the whole in well, and pour it into the tin frames. Experience can only teach the precise extent candies ought to be grained, as sugars differ in quality; but this gives a fair average.

Red Cocoa Nut Ice.

Proceed exactly as in the white, with the exception that any loaf sugar will do, and boil to the ball or 240 degrees; when done put in an egg cup full of cochineal, and finish as before. The reason why this is required higher in degree is on account of the color which will reduce it.

NOTE.—Where large quantities of Cocoa nut Ice are made or required, twenty-eight pounds of sugar to about a dozen or more dry cocoa nuts is used, and fine powdered sugar put to the mass, to assist the grain, and poured into large frames on the slab the previous night, and cut into blocks in the morning.

Cocoa Nut Candy.

Same as the previous, made with raw sugar, but no lowering, and with dry slices of cocoa nut instead of grated; use exactly the same method in graining and pour out into your frames.

Cocoa Nut Hardbake, or Eggs and Bacon.

To a seven pound boil as previously instructed, add when at the crack, half an egg cup of cochineal, and boil it in, previous to which oil your slab, and lay it over closely with dried slices of cocoa nut; sprinkle over the slab, between them, some nonparels, or hundreds and thousands, pour your sugar gently over them. For all these kinds of goods form a square with the irons, within which pour your sugar. It must be evident to the reader that in giving the amount of cochineal or any other color in this book, it must be varied according to its strength and the shade required.

Crystallized Cocoa Nut Chips.

Take a dozen cocoa nuts, more or less, shave off the rind, cut them into thin slices with a sharp knife or machine for the purpose, to be had from the author. They must afterwards be well dried, but not shrivelled, in a warm place, then place them in a bevelled tin box or shape about 4 inches deep and 12 inches over (size not particular); take, for example, 7 lbs. of refined sugar, boil to a small thread, 225 degrees, then stand it aside till a skin forms on the top, pour it over the cocoa nut in the box, keep the cocoa chips under the syrup, and put it in a hot place or stove from 90 to 100 degrees, 8 or 10 hours, pour off any superfluous syrup, place it again in the stove till dry, when cold it can be knocked out for use.

Everton Toffee.

This article varies with the different makers: some make it with loaf sugar for the sake of color, but it is not so good in flavor; others put the butter in with the sugar, when first put on the fire, which method possesses no advantage. but, on the contrary, causes loss of time in boiling, weakens the sugar, and spoils the flavor; this, however, is the old process of making it. The best method is as follows: To

7 lbs. of best raw sugar put 3½ pints of water and boil it between the ball and crack or 245 degrees, put into the boil 1 lb. fresh butter, boil it nearly to the crack over a slow fire, add a teaspoonful of essence of lemon, just boil it in, and pour into the frames. For special purposes 4 to 8 ounces more butter can be used.

To Ice Cocoa Nut Paste, etc.

Make an icing as directed in sponge sugar, add the juice of a lemon, but beat it much more; when your cocoa nut is nearly cold, proceed to ice it with a palate knife, lay a thin coat on first, and let it dry, and then finish with a thicker coat. For white cocoa nut use pink icing. For red ditto use white. The creams before spoken of are iced in the same manner sometimes; care is required to lay the icing over smooth, and the best sugar must be used for the white.

Victoria, Alexandria, and Albert Rocks, etc.

These are pulled sugar cased with red or yellow; reduce and boil to the crack the quantity of refined sugar before named, when done pour two-thirds on the slab, put an egg-cup of cochineal or some strong saffron water to the rest, just boil it up, and pour out separately put a little acid and any of the essences desired to flavor with, into the first portion when cold enough to pull; when pulled case it over with the colored portion, after which stretch it out and shape it to the size and form of a child's wrist, then mark it with a knife on the top surface diamond form, or right and left angles.

NOTE.—The hook on which sugar is to be pulled must be large, taking a sweep of at least a foot, and four to six inches wide from back to front, and fixed firmly against the wall, five feet from the floor.

Large Rocks, Strawberry, or Raspberry.

Square or round are made in the same way as the last, with some of the solid sugar put into the middle of the pulled sugar, doubled over a half a dozen times or more, and afterwards cased, they are flavored with any of the fruit essences, and for all very thick rocks the sugar must have a little more lowering and be boiled a little beyond the crack, and when pulled out to the diameter of about six inches, put them between two iron bars; by turning over, when half cold they become square, and when cold are chopped in slices.

Boiled Sugars in Moulds.

There are many kinds of boiled loaf sugars, lowered and colored as for drops, and cast into iron moulds of all shapes, and before the whole mass sets pour it out, which leaves that only which clings to the shapes; as they are well oiled previously, they easily come out when the mould is parted.

Boiled Sugars as Medals, etc.

These are from the same sugars as the last, some are cast in moulds, but others are cut off like the penny cushions from the clear sugar, put into small round rings made of tin, and afterwards pressed on the top with a die.

NOTE.—It must be observed in boiling sugar to keep the sides of the pan free from accumulation of candy ; this can be done without trouble, by having tin or copper covers without rims to lay over them for ten minutes when they begin to boil.

Imitation Plum Puddings.

These were a very great novelty when first made : though not so general now, they are still made at Christmas in some places. The following plan will be found to answer for them : having got ready picked three pounds plums, two pounds currants, half pound peel cut in strips, and about one pound of almonds blanched, and cut into small pieces to look like suet, take seven pounds of raw sugar, boil to the blow (if very strong sugar is used it must be reduced), let it remain off the fire a short time to take some of the heat off, then grain it in the usual way, and immediately put into the sugar your ingredients, work an ounce of mixed spice into it thoroughly with the spatula, put it into wet pudding cloths, and tie them tight, exactly the same as a pudding, and hang up till they get firm

Brandy Balls, and Clear Balls.

Brandy Balls are made with brown sugar boiled to the crack, and when on the slab work in of good peppermint sufficient to make them strong; some make them black by working in about an ounce of ivory black to seven pounds of sugar, they are cut as before directed, and rolled round with the hands; if left as they are cut, they are called peppermint cushions, they are also put through a ball machine.

Clear Balls.

Are made exactly the same, with loaf sugar colored with cochineal and saffron and flavored with lemon.

Sponge Sugar, or Honey Comb, etc.

Having made a wooden frame about twelve or sixteen inches square, and four inches deep, place it on a wet slab or wooden bench; take seven pounds of loaf sugar (no lowering), boil to the caramel degree, previous to which, in a pound jar, three parts filled with fine powdered sugar, mix the whites of two eggs, beat it well till stiff, when the sugar comes to the degree required, put in any flavoring or color you like, take it off, pour your icing in, and immediately agitate the whole quickly with the spatula; in two or three minutes it will rise to the edge of the pan, let it fall again, and continue stirring; as soon as it begins to rise the second time, instantly pour it into the frame. Many fail at this process, from pouring out at the first rising, which on the slab becomes perfectly flat, and heavy; when cold, remove it, by passing a fine string, or long palate-knife underneath it.

Love Rock, or Rock Varieties, etc.

As before observed, no amount of instruction will inform the reader sufficiently of the manufacture of these goods, but, having mastered the principal difficulties of his business, which it is hoped this book will assist him in doing, he may try his hand at some of these special kind of goods, which take their origin from "Love Rock," that is, the word "LOVE," as thus printed, being seen in the stick, wherever broken off; the dark outlines of the letters are the solid clear sugar made into the shape of the letters, and filled in with sugar about half or three parts pulled (if too much, it becomes windy); to do this at first, and to exercise the reader's ingenuity, he must have a very warm slab, and not boil his sugar quite to the crack (they are not difficult, and after all only an exercise at casing in various forms); the words being cased must be kept in shape, and covered with the remainder of the pulled sugar, and afterwards cased again with the solid sugar; it is then pulled out in straight sticks about an inch thick. None of these operations can be carried on without an expert assistant.

Crystallized Imitation Ginger.

Have Lozenge trays, or any trays, about an inch in depth, filled with starch-powder (or starch-powder, terra-alba, and flour mixed and well dried); make a level surface with a smooth stick, then with your ginger-moulds (or pieces of ginger attached to a stick an inch apart) make clear impressions on the powder, with the same to the depth of the moulds, work them slightly about, to make the impress a little larger than the models; put on a boil of sugar any size you like (without lowering), boil to the degree of blow, or 235 degrees, put in half a teaspoonful of extract of ginger, and a little saffron to tinge it, then take into a drop-pan with a lip to it, as much of the syrup as you require, grain it, and fill up the impressions; when cold, brush off the powder and lay them in crystallizing-pans, with the face downwards, and wire frames between each layer, make sufficient syrup to cover the whole, and proceed exactly as stated for crystallizing cocoa chips. By the same process of boiling the sugar and modelling, other fancies can be made.

English Almond Rock.

To seven pounds of raw sugar, put three and a half pints of water, boil to the crack, pour it on your slab, and put over it quickly four pounds of picked Barbary almonds, mix them well in; when very firm, make it into a thick block, place it on a wooden bench and cut slices off with a long thin sharp knife; it is safer to reduce the above a little if the sugar is strong, or it will grain in the working.

Almond Hardbake.

Lay your split almonds on your slab or frames, round or any other shape, proceed as in the last boil, and when the sugar is done pour thinly over.

Clove, Brown Acid, Black Jack, etc.

These are boiled to crack, are all made from brown sugar, and flavored with the usual flavoring; ivory black is used with the last, mixed in after it is poured out about an ounce to seven pounds; they are pulled out and rolled into sticks.

White Acid, Rose Acid, Sticks, etc.

Instead of making the drops from the boils already named, such as acid and rose, make the same into sticks; keep them rolling on the slab till cold.

Small Bulls' Eyes and Nelson Balls

Are made for the boils as instructed for sticks either plain or striped, the bulls' eyes are cut with scissors and the balls are passed through the machines for the purpose.

Ginger, Lemon, Rose, or Peppermint Candies

Are all made from loaf sugar, without being reduced, by acids; the same instructions given for horehound will do for these; as regards boiling and graining, they can be colored with saffron and cochineal, and flavored as their names import; the difficulty a novice finds with candies is, that they grain too much in the pan, before he can get them out; to avoid this, as soon as you see the place at the side of the pan white, where you are rubbing against, discontinue, and stir that well into the boil quickly, and pour out into tins.

Burnt Almonds.

These, as commonly sold, are not burnt, but merely sugared; to make them, put two pounds of Barbary almonds into a good sized pan, boil four pounds raw sugar to the thread, or 235; having kept the almonds in the pan warm, put a quarter pound of sugar dust amongst them, then pour about half a pound of the boiled sugar over them, and immediately stir them well about with the spatula; the sugar thus having grained partly over the almonds, and dried, and having parted those that adhere, proceed to do the same with the rest of the sugar, till you get them to size; increase the syrup to about a pound, after the first coating, but avoid putting too much on at a time; sift them in a coarse sieve to take the loose sugar away; to finish, boil about three or four pounds loaf sugar as before, with an egg-cup of cochineal; proceed with that as before directed. When at the last, add to the remainder of syrup, an egg-cup of cochineal or liquid carmine, the same of water, poured over and stirred till well covered; turn them out in a coarse sieve to dry.

Pear Drops, Raspberry Drops, and Rose Drops

Are all boiled and made the same way as instructed for pine apple, color and flavoring excepted; an egg-cup of cochineal put in when nearly done and half a teaspoonful of essence, and a quarter of an ounce of acid, mixed in on the slab ; half a dozen drops of the otto of rose is sufficient for the rose drops.

Turkey Sugars, Lemon, Peppermint and Rose.

Take seven pounds of loaf sugar lowered, and boil to the crack, when half cold put in the usual quantity of flavor of either sort, and commence to pull on a large hook, fixed against the wall, till it begins to get stiff, and shines, when you can form it into either straight or twisted sticks ; to color the rose, keep some cochineal paste or carmine ready, and put it in the sugar on the slab.

Penny Sticks (clear).

Beyond the instructions given in the article on "hand-made" goods, and those also on "sugar boiling," no idea can be conveyed by a book as to pulling these out to the required size, and smooth : as only with practice can it be done properly.

Penny Goods—Cushions, Sticks, etc., (pulled.)

Previous to pulling the sugar as directed in Turkey sugar, mix with two or three small pieces of the boil, any color you fancy, and keep them warm ; after pulling, lay these stripes along the sugar alternately, pull it out a little at a time as thick as your thumb, cut it off in cushions an inch long with the scissors, two for a penny and twice the size and thickness for penny pieces ; for sticks pull it out as thick as a little finger, about a yard long and twist them.

Peppermint, Lemon, Rose, etc., Pastilles or Drops.

These are not made of boiled sugars but on the old plan of peppermint drops. Sift any quantity of powdered loaf sugar through a coarse hair sieve, afterwards sift the same through a fine sieve (to take out the fine sugar), then put the coarse sugar into a glazed earthen pan, mix it very stiff with water, flavor or color it with any thing you like to your palate, lemon juice, etc., and take out enough to nearly fill a small drop pan, which must fit into an iron ring on the stove, keep stirring it till it gets near to the boil, then take the drop pan, just tilt it and stroke the drops off from the lip with a piece of wire on to tin plates; a little practice will perfect any one in this; in an hour knock the tins on the back to loosen them into a sieve. The French mix these drops with the juices of fruits, instead of water and artificial essences, etc., and sell them at a high price; if the above gets too thin on the fire add more sugar, it ought to be of a substance just to flow from the spoon or spatula.

Cherry Stones and Rose Buds.

These are red casings over pulled sugars, flavored as their names import, the rose buds are white with red casings, the cherry stones pink with red casing, one is put through the Nelson ball, the other through the acid drop machines

Real Burnt Almonds, or French Pralines.

Boil three pounds of loaf sugar in a pint and a half of water; soon as it boils, put into it two pounds of Valencia almonds (or Jordan), and boil them to candy height; take it off, stir it with the spatula, till it all grains into powder, then throw them into the coarse sieve, sift and separate them, after which make them into four parts with some of the siftings, and keeping a thin plate over the stove; put one of the parts into your pan, which for the purpose ought to have a thick bottom, stir them gradually, the siftings will dissolve, and adhere to the almonds, and they gradually become crisp, and parched, of which you must judge by tasting, when so, turn them out, and proceed with the others the same. They are sometimes sold in this state, but to finish them as in

France, when the whole are burnt, wash your pan, return the almonds to it, and in another small one boil four pounds of sugar to caramel, put an egg-cup of liquid carmine or cochineal in it, pour it over the almonds, in two coats, stirring them each time, and finish, to give them a nice crinkly appearance.

Cherry Balls, Fishes, Tom Thumb Drops, etc.

Red, yellow, or white are all made the same as the previous boils, with the exception of not using tartaric acid, the gold and silver fishes from the white and yellow boils; the cherry balls from the yellow and red; the Tom Thumb from any of them, and mixed colors.

NOTE.—In all boils of sugar it is important that the sides be turned in soon enough where the sugar is to be worked for hand-made and machine goods.

Imitation Crystallizing.

Many of the descriptions of Fruit Essence drops named in this book, and also other shapes, that can be made from the same boils, provided you have the machines, are very often sold as crystallized goods; the process is very simple, and can be done after passing any kind of drops through the machine, and while warm, but quite set; break them up, sift them well put them into a large clean boiling pan; have ready a rather weak solution of clear gum-water, in which dip your right hand, and with the gum-water that clings to it, work over the drops. When they are all equally wet, but only slightly so, spread over them according to quantity centrifugal sugar (a white granulous sugar, sold at the grocers), shake them well up with this two or three minutes, put them into trays in the stove to dry, when dry, sift them.

Imitation Indian Corn.

An excellent imitation of Indian Corn in appearance, can be made as follows: First loosen the rolls of your Tom Thumb machine, by unscrewing them a quarter of an inch, pull a portion of any of the yellow boils flavored case it over thickly with some of the clear sugar, flatten it, and pass through the rolls according to the width; cut them the length of the pods of corn, and when half cold, fold them loosely to the shape.

Pink and White Sugar Candy.

Copper pans are sold or made for this purpose; they are perforated, so that fine string can be put across, and fixed outside by pasting paper round; they are then filled with clarified loaf sugar, some white, some tinged with carmine, and some with saffron; for blue, a weak solution of indigo; the sugar being boiled to the small feather, or 230 degrees, stand it aside till a skin forms on the top, pour it in the moulds and place it in the drying stove, at 100 degrees Fahrenheit, for a week; when the crystals are formed, pour off the superfluous syrup, rinse the candy out with lukewarm water, and again set it in the stove to dry. It can afterwards be knocked out. Brown candies are made the same way, with the best strong raw sugars.

Chocolate in Boiled Sugars.

Raw sugar boiled to the crack, and chocolate powder worked into it on the slab; when the sugar is strong, it must be reduced, as there will be a great inclination to grain; when the chocolate is mixed in, roll out into sticks, or for drops pass it through the machine.

Ginger Toffee.

To seven pounds of loaf sugar, put the usual lowering and water, and a tablespoonful of saffron water, boil to crack; then put in a half a teaspoonful of extract of ginger (not essence) which just boil in and pour into the toffee frames.

Doncaster Butter Scotch.

This article, which is almost as renowned as the Everton toffee, is made in the same way, but by using treacle with the sugar; either the common or the "golden syrup" is used, and butter the same, without any lemon; it is poured on the slab, in very thin sheets, marked out with a cutter in strips, which are afterwards wrapped in long pieces of paper or tinfoil, twelve are put in a packet, and sold at sixpence the packet; the treacle used in this makes the article get very soft and sticky, but which appears to be thought no disadvantage, as it eats very rich.

Raspberry Toffee.

To seven pounds loaf sugar put in three pints of water, a quarter of an ounce of cream tartar; when at nearly caramel degree put in half a pound raspberry jam, previously thinned, with an egg-cupful of cochineal, this will reduce the sugar to about the crack, if not it must be got to that degree, stirring the white with the small rod mentioned in French rock, after which pour into frames.

Persian Sherbet.

Mix fourteen pounds of fine powder sugar with five and a-half pounds tartaric acid, and five pounds of carbonated soda; before the soda is added, work into it one ounce of essence of lemon; a little orange essence adds to the fragrance and flavor; there is a cheaper article made but the above is not to be surpassed.

Before we bring the observations on boiling to a close, it may be as well to remark, that it is very necessary to make allowances for changes of season, and the weather, in boiling sugar; the evil effects of any extremes may be to a great extent avoided, if studied by the boiler, and, where goods are exposed for sale, this is very important: for instance, in very hot weather, some goods must be boiled higher than in very cold, and *vice versa*, but these are matters which any experienced man will allow for; with regard to the size of boils, they so depend upon the usages of the house, the employer, or the foreman, that no rule can be laid down for them, and those mentioned in the book are merely for example; but at the same time we will remark that, while there is greater risk, there is no advantage in having very large boils of sugar.

We have got through work with more comfort and greater celerity, with twenty pound boils, than larger ones, whatever quantity of goods have been required.

On Crystallized Goods, Liqueur Bon-Bons, etc.

These are now made very largely in England, and will bear comparison with the French. In the International Exhibition, one case of English crystallized goods quite equalled them; this was a small unpretending display by an exhibitor named Marshall, in the eastern annexe, who, though the author found had received but "Honorable Mention," for the brilliancy of crystal, delicacy of color and finish, deserved the prize-medal. The manufacture of crystallized goods is made a separate one, and, indeed, cannot be properly carried on in a small way, and the prices at which they are sold wholesale does away with the necessity of doing so ; we, however, give the processes.

Liqueur Bons-Bons, etc.

Have trays of thoroughly dried starch-powder filled about an inch deep, and smoothed over with a board ; make impressions with any plaister designs, arranged on a stick in a row ; any quantity of sugar can be taken, and the syrup boiled to about 230 degrees ; then fill your moulds from either a funnel or drop-pan with a lip, according to the size of bon-bons required ; the syrup must be previously flavored with any of the artificial essences, or spirituous liquors ; the "attraction of cohesion," as before mentioned, takes place in the mould, and the outside becomes a crust, leaving the inside in a state of liqueur. They are afterwards dried in the stove, taken from the trays and crystallized in tin boxes about two feet by one foot, and four inches deep, by boiling syrup, to about 223 degrees, not higher, and then put them in a stove or warm place for ten or twelve hours The syrup must be cooled before putting on the goods; when crystallized, the superfluous syrup can be poured out from the top, or drawn off with a plug at bottom; then re-dry the goods in the stove.

Liqueur Almonds and Comfits

Are made exactly in the same way as the last, and afterwards coated with gum mucilage and powdered sugar, or starch-powder, sufficiently to stand the working of the pan in which they with the syrup are to be agitated, to make them the smooth comfit they become afterwards.

Gum Pastilles, etc.

Pastilles and various other shapes in gum goods are made with a thick mucilage clarified, and syrup boiled to about 240 degrees, or more, according to the substance of your dissolved gum. When they are mixed, flavor with any essence desired, carefully, as they are unpleasant if too strong; then run them into starch-powder, as liqueurs; and observe the same rule in crystallizing as before given. In crystallizing, a piece of linen or canvas should be fitted to the top of the tins containing the syrup, to prevent a crust forming, which can be lifted to see how the crystallizing progresses; if enough, draw off the syrup, and return them to the stove to dry.

Pink or Yellow Jujubes.

All gum goods are best made by steam: these are prepared in the same manner as gum pastilles, the gum is perfectly clarified, and mixed with the strong syrup, and poured into oiled tin trays, and dried in a stove, heated by steam, till quite firm; they are afterwards cut into form, by a machine now, but formerly by a knife or scissors; highly polished or silvered tins are used instead of oil for best goods.

To Crystallize Preserved Fruits.

Take them from the syrup, wash them in warm water, and drain them, put them in the stove to dry; afterwards, proceed to treat them in every respect as directed for other crystallized goods. Tins, in which any thing is crystallized, should have a hole at the bottom, in which a cork is placed, to draw off the syrup, though they can be drained from the top.

To Preserve Fruits whole in Syrup.

To preserve any of the plums, damsons, apricots, peaches, nectarines, etc., they must not be too ripe; prick them, place them in earthen pans in a slow oven for an hour, or scald them slightly, but not to boil or break them, but merely to make them tender; make a syrup of sugar to the degree of thread, and pour over them hot; in a day or two draw the syrup off, put some more sugar to it, and make it up to its original substance, do this so long as the juices from the fruit make it thin; as it must be left thick, keep them in a dry and cold situation.

Raspberry Jam.

The fruit being passed through a cane or copper sieve, and reduced by boiling about a quarter of an hour, add the sugar pounded small; to every pound of the original weight add three quarters of a pound of good loaf sugar, continue boiling and stirring it till it will set on a plate, the sharper it boils the better the quality and color; in known quantities these jams could be boiled to time, but not otherwise.

In any case where fruit is of a firm, dry nature, it is necessary, before mashing the pulp or drawing the juice, to soften it in the oven, or over the stove. Water may be used in small quantities, to help this maceration; it is a fallacious idea that wet fruit will not keep, when made up into either jellies, marmalade, or jams, always supposing the fruit to be *sound;* the evaporation it must necessarily undergo, before it comes to the proper degree in boiling, carries it off.

Red Currant, Black Currant and Gooseberry Jam.

In addition to the pulps which are left in the making of "jellies," and which can be made into good common jams, the above jams are made from the whole of the fruit, both pulp and juice together, as follows: a copper or cane sieve is required, to rub the fruit through, just small enough to prevent a whole currant passing; after rubbing the fruit through, treat the red currant, or any fruit where color is an object, the same as raspberry jam; the dark, such as black currant, ripe gooseberry and others, are boiled the same, but do not require so much care as to color.

Strawberry Jam.

Though any kind of strawberry can be made into jam, the best for the purpose is the scarlet, on account of color; proceed exactly as for raspberry jam, but being of a much less body it will take longer in boiling, which requires watching, as, being so thin, it does not appear boiled enough when it may be too much so ; try it often as directed, and when it jellies remove it from the fire ; some add one-third red currant pulp, which improves the jam.

Preserved Ginger (Mock).

The stalks of lettuces can be so preserved as to deceive many judges of the article ; when the luttuces are running to seed but not too old, the stalks are to be cut off, washed, cut into pieces, and put into a thin syrup of sugar in which some of the best bruised ginger is put, boil the whole for half an hour gently, let it remain a day or two, repeat the same process a few times till tender, and tastes of the ginger ; to finish, draw from the syrup and boil some fresh sugar to thread and flavored with extract of ginger to palate, into which put the stalks and heat it up once or twice till clear like the West India. Put it in jars with thick syrup.

Preserved Orange and Lemon Peel, etc.

To carry this out profitably it must be done on a large scale. The few wholesale houses who do so, sell it at such prices that prevents the necessity or the possibility of smaller competing with them, but if from circumstances it is required to be done at home, take any quantity of Seville oranges, Messino lemons or citrons. Cut them in half, lengthways, and squeeze out the juice, which can be preserved for other purposes. Make a strong brine with salt that an egg will float in it. Keep the peels in this not less than a week, then broil them in water till tender, so that the nails of the forefinger and thumb will pass through. Throw them into cold water, and take out the pulp, which is useless. Fit the caps of peel loosely into one another, and pack them in rows round a tub till the bottom is covered. Then proceed with another layer. Make a strong syrup with loaf sugar, pour it over not very hot. In a day or two add more sugar to the syrup, and warm up again. This must be continued till the syrup keeps thick, and the peel kept in it till it becomes colored and saturated. It can be forced into condition by continually pouring boiling hot syrup over it, but it is not so good; if required to be candied, drain from the syrup and dry it in the stove; boil the sugar to the blow or feather; put your peel in and keep your sugar grained only at the side of the copper, in which dip each piece. It is then put on wire frames till set. The raw peels can be kept any length of time in brine.

Raspberry Jelly.

This is a very favorite jelly, and can be made exactly as directed for red currant jelly, but as it does not require the same time in boiling before it becomes a jelly, it must be attended to closer. Jellies are often put into glasses, and tied over, and they have a very nice appearance if made clear; in making them some prefer to boil the sugar to the crack before they add the juices.

Raspberry Vinegar.

In making quantities of jam, if the raspberries have been bought in bulk, there is a great deal of the juice which may be applied to this purpose without materially affecting the quality of the jam. To every gallon after it is put through the jelly bag, put eight pounds of loaf sugar and one quart of wood vinegar (or pyroligneous acid) or three quarts of common vinegar. This can be fined down afterwards with isinglass dissolved first in half a pint of the vinegar; it can also be made by soaking the raspberries in the ordinary vinegar, and afterwards straining. To every quart put two pounds of sugar.

To Keep Jams or Jellies.

The principal cause of either of these getting mouldy or fermenting is that they are not sufficiently boiled. If this is found to be the case with any quantity, and they become very thin, the best plan is to reboil them and make them stiffer, but this spoils the color.

NOTE.—Jams and jellies ought not to be shut up in a cupboard or close chamber, but kept on shelves where there is a dry and cool current of air.

Raspberry and Black Currant Squares or Cakes.

These are the pulps of fruits, and before any sugar is put to them they can either be preserved for future use, or dried down immediately, and if so they must be evaporated over a moderate stove till they flap against the side, when stirred with the spatula. When it arrives at this substance, it will also show the bottom of the pan when moved about; when so, mix in powdered sugar, almonds, seeds, or any other addition thought proper, spread it out on wafer paper, cover with the same, and put a tray on it to keep it flat. The receipt for keeping pulp, juice, fruit, or any thing of that nature will be given in another page.

Marmalades.

The machine-cut marmalade now so universally sold is, if genuine, so much superior in appearance and use, that it has quite superseded the old style of making; the price it is generally sold at wholesale precludes the necessity of small makers attempting the manufacture, but as circumstances may arise in which a knowledge of the mode of preparing may be useful, we give the processes for marmalades, jams and jellies. The machine for cutting peel can be had from the author.

Seville Orange Marmalade.

Take any quantity desired of the Seville oranges, and squeeze out the juice, after which boil the peels in plenty of water till they are very tender, so soft that you can nip them through with your thumb and finger nails, then put them into cold water, scrape out the pulp with your fingers, without breaking the peel, after that cut the peel in very fine strips with a knife, or pass it through the machine, strain the juice, and to every pint and pound of peel, boil in the juice a pound of loaf sugar, till it jellies when dropped on a saucer, then add the fine-cut peel, which merely requires boiling in the syrup a short time.

Lemon marmalade is made precisely as the Seville orange, but is not so much in request.

Apple Marmalade or Jam.

Take any quantity of good boiling apples, pare them, and cut the cores out, put them into the pan, and cover with water, boil till they break and become soft, rub through a cane sieve, and to every pound put three quarters of a pound of loaf sugar, in small pieces, boil till it sets on a plate.

Apple Jelly.

Take any quantity of good juicy eating apples, pare them, and cut the cores out, put them into the pan, and cover with water, boil till they become quite soft, but not mashed, drain the whole off through a sieve as coarse as muslin, afterwards pass through a jelly-bag. Clarify some loaf sugar to the thread and add a pint to a pint of juice. Boil, take off the scum as it rises, stir and boil till it jellies on a plate, the pulp will make common jam.

Quince Marmalade or Jam.

A great favorite with many; is prepared when the quinces are quite ripe, the same way as apple jam.

Damson, Apple, Apricot, Plum, Black Currant, Paste or Cheese.

Prepare the pulp of these fruits by drying down; after being rubbed through sieves, as directed in the receipts for "Raspberry cakes, or squares," they are put into oil tins, or shapes, and dried in the stove, at a moderate heat; in a few days they become stiff enough to cut; the juice in these are not taken out; the black currants must be rubbed through a fine wire sieve to keep the seeds out. For all these purposes, stir a fourth of their weight of fine powdered sugar, when off the fire, into the mass. If the sugar is put to it before this, they will not become the proper substance.

Red Currant Jelly.

Put any quantity of red currants into a pan or jar, put them into an oven to soften, but not hot enough to smash them; if a very cool oven, they can be put in over night; in the morning strain them through a sieve, to take the juice out, pass it through a jelly bag till fine; to every pint of juice, pnt fourteen ounces if loaf sugar, or one pound clarified syrup. Boil quick till it becomes a jelly, to tell which, in about twenty minutes try it, by dropping some on a plate or saucer; let it remain in a cool place two minutes; if it sets take your jelly off the fire.

Note.—Practice decides the proper substance of jellies, by a web which forms on the skimmer after dipping it in them, and it is the best method of trying them.

Black Currant Jelly.

Proceed the same as in red currant except in passing the juice through a bag; a hair sieve will do for this as it is not required so clear.

Pulp for Jams.

TO PRESERVE WITHOUT SUGAR.

Rub the fruit through a sieve, and bring it to the boil; take it off the stove, and fill with a large funnel one or two gallon wide-mouthed stone bottles, bung them down with good corks, and tie them over with string (they must only be filled to the shoulder), place them in a tank of cold water with a board made to fit the bottom, as soon as possible, and let it get up on the stove to 180 degrees, by the thermometer, then place them in a very cool place. We have preserved fruit for years by this method perfectly fresh, but it must be quite sound when boiled.

Bottled Tart Fruits.

Take any quantity of fruit dry and sound; pick it and fill your bottles; nearly fill a copper, with a board at the bottom, with cold water; place the bottles in up to the neck; let the water get up on the stove to 150 degrees, by the thermometer; let them stand after this twenty minutes at the same heat; when they are taken out fill up with boiling spring-water, bung them well down, and tie over, they will keep any number of years under this process if the necks are dipped in melted bottle wax.

Juice of Fruits without Sugar.

The juice of fruits can be preserved any length of time, as well as the pulps, by strictly observing the rules as laid down for preserving without sugar. Where for special reasons it is not desired to lay down large quantities of sugar into jam, these receipts, etc., are very valuable if at any time sugar becomes especially dear, when the fruit can be used as required.

To remove Acids from Boiled Sugar.

It occasionally occurs that acid goods, having grained, or become stale, are useless in that state; to divest them of all the acid, supposing there to be twenty-eight pounds, dissolve it in twice the quantity of water that is usual with sugar, break into it and mix seven pounds of whitening or powdered chalk, put on the stove to boil up and thoroughly incorporate, then pass through the jelly bag till clear, the syrup can afterwards be used in other sugars.

Tests for Adulterated Goods.

When any description of goods is believed to be mixed with farina or starch, dissolve a small portion in a tumbler with warm water when all melted, put a few drops of solution of iodine, to be obtained at any chemist's, into it, and if so adulterated it will turn yellow.

For detecting Terra-Alba, or any earthy matter in Comfits, etc.

Dissolve in a tumbler with warm water some of the articles: if adulterated with "Terra Alba," or earthy substances, they will be set free in twenty-four hours, and fall to the bottom, but if all sugar it will remain in solution and clear.

Colored Sugars.

These are very useful for various purposes, especially to sprinkle over iced cocoa nut, the creams, etc., for which receipts are given previously; pink is most usually put on white, and on others according as the fancy dictates. To make them, prepare coarse powdered sugar, as directed in the receipt for peppermint and other drops, put about a pound or two in any small clean pan, and warm them on the hot plate, rubbing them with the hand until they are thoroughly heated, then add a little of the liquid colors, rub it in well till dry and keep till required. Dry colors must be moistened with water previous to using.

Fruit Syrups, Cappillaire, etc.

To be sold by the gallon or retailed in bottles, for mixing with punch, cordials, or used as summer drinks. the sick room and other purposes; boil clarified syrup to smooth, 215 degrees by the thermometer; to each pint add an ounce of an acid, either tartaric, or citric acid, add any of the fruit essences to suit the palate, and tinge them slightly with color such as saffron or cochineal if desired. For cappillaire, the syrup must be white, without acid, and flavored with orange flower water. The lemon syrup must be made with citric acid, and kept white, or slightly tinged with saffron water, For the above use the juices of real fruits when in season.

On Lozenges, Comfits, etc.

Though formerly almost every hard confectioner made his own dry goods, it has become of late years quite an exclusive trade, through the introduction of expensive steam machinery, nearly every kind is offered at such prices, principally from Scotland, that they supersede the necessity of making them in small quantities. These goods cannot be made successfully unless there are proper separate conveniences, from the boiling room, especially adapted, as they require great cleanliness, and freedom from smoke and dust; it would therefore be foreign to the purpose of this book to enter upon the manufacture of all the varieties of lozenges, comfits, etc. Through the aid of machinery four tons of comfits can be produced in one house in a week; they are enabled therefore to sell them not much above the price some pay for the raw material. Whether more sugar is consumed in dry goods, than in boiled sugars, cannot be exactly estimated; but the greater facilities they offer for export over them would lead to the conclusion that such is the case. The increase in the consumption of sugars for all kinds of hard confectionery, of late years, is something enormous, and approximates to about 400 tons weekly, averaging £50 per ton, and gives a gross value of about a million a year for raw material alone, to which must be added expense of labor, and all the adjuncts of the wholesale trade.

On the Manufacture of Lozenges.

Machines are now made for grinding loaf sugar so fine and in such quantities, for the purpose of lozenges, icing, etc., that they save a vast amount of labor to the trade; under the old system pounding the sugar was considered by many the best where color was the object, such as the best peppermint lozenges and other kinds; there can be no question but that the great friction during that process whitens the powdered sugar, but as the quantity is now considered of most importance, the pounded sugar predominates.

Medicated Lozenges, etc.

Medicated goods require great discrimination in the preparation and finish, and do not all come within the province of this work; the receipt for mixing any kind will be found in the pharmacopœia, or can be had from the author; many come strictly within the province of the druggist. We give only those of ordinary sale, but as there is but one principle adopted to make all kinds, any person who makes these can also make the others: the paste is mixed and the operation conducted so far precisely as mixing flour with water to make dough; using thick dissolved gum instead of water, and powdered sugar for the flour. It is rolled out the same, using plenty of starch powder to prevent it sticking; the thickness is regulated according to the lozenge, from an eighth to a quarter inch, and the process for making as follows:

Mixing for Common Mints.

Take two quarts of thick gum mucilage which has been strained free from specks, and work it into twenty-eight fine powdered sugar, with one ounce of foreign peppermint. For a middling quality, work into the same one and a half ounces of best American mint. For the best, two ounces of Mitcham peppermint: for the extra qualities large or small, three ounces to the same quantity. The above are given as examples, but there are many medium qualities made.

Common Ginger Lozenges.

Work into the same mixture of gum and sugar one pound of the fine powdered ginger, half ounce of the essence of lemon. For the best, one pound finest Jamaica ginger, half ounce of the extract ditto, half ounce essence lemon.

Cough Lozenges.

Dissolve liquorice to a thick consistence, and work into the paste sufficient to make them a light or dark brown according to fancy, work well in two ounces of ipecacuanha in one powder, one drachm of acetate of morphia, one ounce oil of anniseed, and one ounce of tartaric acid to powder; these ingredients must be thoroughly mixed.

Nearly every manufacturer makes his own cough lozenges, and gives them qualities and a name different from others, but the above cannot be surpassed as a really good and effectual cough lozenge.

Coltsfoot Rock.

Instead of two quarts of gum mucilage use one, and about a quarter pound gum dragon well soaked in a quart of water; this must be done twenty-four hours before it is required, force it through a coarse cloth or sieve; mix the liquorice in with half an ounce of essence of lemon; the paste must be stiff and tough to pass through the machine or it will not look smooth.

Rose Lozenges.

To the same weight of paste as first named, work in a drachm of real otto of roses, half an ounce of acid, and carmine to color according to the tint desired.

Musk Lozenges.

To the same amount of paste, add one drachm of pure musk in powder, acid as in the last, and use carmine to color: any of the colors mentioned before in this book can be used with lozenge paste to assimilate them to the name they bear; also to bring up the color of white lozenges (peppermint, etc.), Prussian blue can be used; avoid buying cheap East India or common gums, they will not make good lozenges, Turkey gums have greater strength and tenacity, and the paste is easier to work and much smoother.

Note.—In the manufacture of lozenges great cleanliness must be observed, and to make them on the smallest scale there must be one very smooth marble, or other slab, four feet by two feet to cut them on, also another to mix them, of less size. Rolling pins of hard wood, two feet long, by two inches diameter, these can be made to gauge the paste to the thickness required. A large palate knife fifteen or eighteen inches in length; a hand brush with long, soft hairs; soft cloths to run through the cutters; lozenge trays to dry them, with edges inch deep, about three feet by two feet, made with good seasoned pine wood, half an inch thick when planed; hot closet or room to dry the goods in, heated by steam, or other method to prevent smoke and dust; lozenge cutters of various sizes and shapes; stamps and dyes are also required in some cases; a box with fine starch powder must be handy; also a jelly pot or some similar article with a small quantity of clean water to soak the edges of the cutter when clogged with paste. As nothing but practice can initiate any one in rolling out a sheet of paste, afterwards to cut it out well, the instruction to do so must be considered only as indefinite, for to make lozenges properly requires a clever hand, and is a separate branch of the trade. In rolling the paste to the desired size and thickness it must be repeatedly lifted with the palate knife to see that it is free from the slab, it must be also turned over three or four times by means of the roller and fresh dusted; in smoothing the surface use the brush freely. The less the paste is handled the better; the palate knife and brush with practice will do all that is required. In cutting out take a straight line to commence with near the left edge, and, however slowly, continue to work parallel to the preceding lines; empty your cutters often and place the lozenges even and flat in your trays previously dusted over with starch powder. Machinery has been introduced for lozenge making, and, though elaborate and expensive at present, no doubt it will become more simplified and cheaper.

Anniseed Lozenges.

Fourteen pounds powdered sugar, one quart gum mucilage. Take liquorice dissolved as before described, and work sufficiently into this mixture to make it the usual brown color hal an ounce of the oil of anniseed, and cut out with an oval cutter.

Bath Lozenges.

With the exception of more liquorice, this is precisely the same mixture as the last (without the oil of anniseed), and cut with a round cutter. This is the trade mixture, but the pharmacopœia gives a different one, as it also does for nearly every lozenge made by the trade.

Balsam Tolu Lozenges.

To fourteen pounds of powdered sugar mix in one quart of gum mucilage, half an ounce gum Benzoin, one ounce powdered tartaric acid; dissolve the gum in spirits in a warm place, or use one ounce strong prepared tincture instead. Round cutter.

Black Currant Lozenges.

To four pounds of black currant extract about the consistence of honey when moderately thick, work in ten pounds of powdered sugar, one pound of powdered Turkey gum, and two ounces powdered tartaric acid; roll the paste on coarse powdered sugar as the last, before you cut them out. Oval cutter.

Cayenne Lozenges.

Fourteen pounds of powdered sugar, one quart of thick mucilage, one ounce of common extract, or half an ounce of the condensed or thick extract of cayenne, six drops rose. Octagon cutter.

Chalk Lozenges.

To seven pounds of lozenge paste, as already directed (with plain sugar and gum), work in half a pound of prepared chalk in powder, and flavor with a little lemon or rose. Cut out with round cutter.

Paregoric Lozenges.

Fourteen pounds of powdered sugar, one quart of gum, one ounce balsam Tolu, quarter of an ounce oil of anniseed, quarter of an ounce spirits of camphor, three quarters of an ounce powdered tartaric acid, colored with carmine and cut with round cutter.

Ipecacuanha Lozenges.

Fourteen pounds of powdered sugar, one quart of mucilage, two ounces of powdered ipecacuanha, three quarters of an ounce tartaric acid, a few drops of otto rose. Cut out with oval-shaped cutter. The ipecacuanha powder must be thoroughly worked in.

Lavender Lozenges.

Fourteen pounds of powdered sugar, one quart of gum, half an ounce of Mitcham oil of lavender. These are mostly colored with a faint blue or deep pink, and cut out with a fluted cutter or other shapes to fancy.

Rhubarb Lozenges, or Long-Life Lozenges.

To four pounds of lozenge paste, as directed for peppermint lozenges (without the flavor), work in a quarter of a pound of the finest Turkey rhubarb in powder, and two ounces of the best Jamaica ginger in powder. Cut out with oval or round cutter.

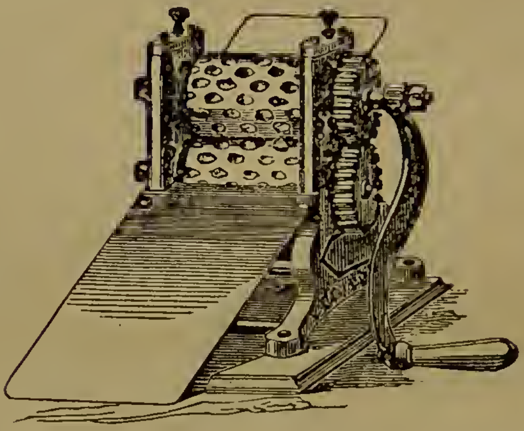
Quinine Lozenges.

To four pounds of paste, as above, work in half an ounce of quinine. Oval cutter.

N.B.—For all the above mixtures the gum mucilage must be a good substance, and the ingredients, particularly where drugs are used, well mixed in.

On the Manufacture of Comfits or Pan Goods.

Through the introduction of steam pans for making these goods, so great a revolution has taken place in the method, and also in the prices, that they are to be purchased genuine at a less price than the sugar itself was only a few years since. Under the old system it took a man a day to make fifty-six pounds of good smooth comfits; the same man could now superintend half-a-dozen steam pans, that will produce 112 lbs. each. A skilled workman in fact is not required at all excepting as to the degree and temperature of the syrup used. We have seen a lad attend to the working of the pans; the new system entirely supersedes the necessity of making these goods under the old plan or on a small scale. The apparatus was introduced in Paris, and consists of a pan in the shape of a ball or orange, about one-third cut off; inside there is a lining, between which and the outside through its whole interior the steam passes. Some are made to revolve vertically on an axis, others to oscillate on another principle and which is certainly an improvement. The first is supplied with steam through the hollow axis in which it works, the others by India rubber tubes. A shaft, carried through a long room and the primary motion of which is derived from an engine, will work by means of pullies a number of these pans; two pounds of seeds will make a hundredweight of large carraway comfits. They are first grounded with syrup and starch powder or flour, they afterwards only require the syrup added in small quantities; when once they are coated with sugar and that supplied continually, they can be left to the action of the pan till completed. The same plan is adopted with almonds and other articles.



It having been established by necessity, the prices of the wholesale trade, and the convenience and facility of manufacturing goods, to have machines, it becomes important to know which are the best to use. The author, from his long practical experience and knowledge of them, can recommend the best machines for any purpose required, upon receiving a communication upon the subject. Collier's, of Rochdale, are excellent, and their efficiency is guaranteed by a host of testimonials. Some houses have a large number of the old style of drop machines, when half the quantity of the best make would answer every purpose, as rolls of any design can be made to suit frames of the new patterns, into which they can be fitted in two minutes. As regards the size of drop machines (unless to use by steam), it is unnecessary to go beyond the seven-inch for any moderate wholesale trade. In smaller trades the lesser sizes are quite as applicable and easily worked. There are many doing a good business who make nearly all their goods by these sizes. But whether one size or the other, they each save an immense amount of manual labor and wages, and make quite easy what used to be the most laborious part of the work, while we at the same time obtain a much larger assortment of goods in beautiful designs. Where it can be conveniently fixed, a turn-table of any required size for the machines to be fixed upon can be fitted at the end of the slabs, in principle similar to those on the railways. If the slabs are so situate, each machine can be brought to work opposite them, affording a great saving of room, and great convenience. We have had one of them in use for years ourself, but have not seen or heard of their being used by any other house.

In working a drop machine for the first time, or if it be a new one, be careful not to put too much of the sugar through at a time. Half a pound is sufficient for the smallest and two pounds for a large size, until it works true and delivers the drops freely. The best machines are now delivered to the purchaser in working order, but they may still require a little adjusting by the workman, which can be done by any person having the slightest ingenuity, the parts in good machines, such as nuts, screws, plates, etc., being portable, and easily shifted. Formerly this was not the case, and there are still some very bad machines sold, and, like a watch that will not keep time, they are dear at any price. They deliver badly, are difficult to work, and eventually are thrown aside as useless. The rolls of good machines require no oiling, though it is a practice some adopt. Those of the best make deliver the goods with the greatest facility without. Where drops or other goods are intended for bottling or air-tight packages, it is necessary to keep them as free from oil or grease as possible, or the goods smell and taste rancid and disagreeable when opened for sale, and they soon become dull and opaque. The slightest chemical knowledge explains this, and it is the greatest reason why boiled sugar goods exported to the tropical climates or having to pass through them, reach their destination in bad condition. We have seen and experienced this in Melbourne. Tons of goods have been sent there, both from this country and America, that never realized the cost of freight.

On Spinning Sugar, Piping, Gum Paste, Ornaments, etc.

The making of the numerous artistic designs in the above is the most difficult and the most interesting of the confectioner's art, and as practised in first-rate houses and families of dis tinction. and especially in France, the workman must not only understand the rules and principles of art as regards perspective, etc., but must be an adept at drawing, modelling, and decoration. The amateur may however practice it for his improvement, and the great satisfaction arising from this pleasing method of employing spare time; and time and patience are very necessary to insure success in these processes, together with skill in manipulation, conception, and design. Gum paste ornaments are used largely for wedding cakes, etc., combined with the liberal application of piping, and we have known many instances in which these alone have fulfilled all the purposes of other and more expensive ornamentation. Great practice is requisite to make a good hand at piping, but we do not see why any moderately ingenious person may not try the process and succeed. The same remarks apply to spinning sugar. Determination and perseverance will accomplish any of the operations here named.

To Spin Caramel Sugar.

Take any small or moderate quantity of clarified loaf sugar and boil to the caramel. take it off quickly and put the pan into a tub of cold water to stop the principal heat, then place it near the stove to keep the sugar warm enough to work with facility.

The moulds you intend to work upon should be copper, tin, or glass, etc., made on the bevil, so as to deliver well. They must be rubbed slightly with fresh butter. The sugar previously spoken of having cooled a little, take a fork and try it by dipping it into the sugar, and hold it up rather high and spin it by a shake of the hand; if it forms threads it will do for the purpose of spinning. Take your mould in the left hand, turn it upside down, take out a little sugar with the bowl of a spoon and pour it out equally in threads or lines certain distances. When this is finished one way turn the mould round, so as to form an angle, and proceed again crossways in the same manner. The threads ought to be the thickness of twine.

When the body of the shape is formed it can be ornamented with the fine silken threads made by spinning the sugar from forks or pronged tools. They can be also made into baskets, by drawing a handle on a smooth greasy slab, and then following the lines with the sugar from the spoon. Spun sugar can also be made into vases, ships, etc., by making the parts separate and afterwards sticking them together with some of the sugar used in the process.

Gum Paste Ornaments.

Blocks, cutters, and moulds are required for this process. Gum dragon is the main and necessary ingredient. It is difficult to dissolve and strain, and to do it properly it requires two persons to wring the cloth through which it passes, but it may be forced through a sieve. The gum must be well washed and covered with water a day and night, then strain it as directed; work it well in a marble mortar, with equal quantities of the finest powder sugar and starch powder. It must be very tough by working it thoroughly and bear pulling till it breaks.

Keep the paste in an earthen pot, with a damp cloth always on it. The above is made better with all sugar, or commoner, with more starch powder, and has been very much adulterated by using plaster of Paris. To take the impression from the moulds, use fine starch powder shook over it, as also in rolling the paste to the required thickness and size. Press the paste in the moulds or blocks with your thumb or the ball of your hand, and cut off the superfluous paste with a very thin knife sold for the purpose. You must then knock it out, or make a small lump of paste adhere to the impression and pull it out.

Sugar Piping for Cakes, etc.

A very fine sugar icing is prepared as directed in the book with the finest powdered loaf sugar and whites of eggs and lemon juice. The tubes through which this is forced are made for many designs in tin bv the "Confectioners' Tool Maker," but they can be made with good stiff writing-paper. They are made similar to a cone, with the tip cut off. It is partly filled with the icing, the top edges turned in, the same as the bags are that the moist sugars are sold in by the pound, then press out with the thumb and forefinger through the opening at the end over your previously iced cake in any form, design, or shape you like, according to the manner you cut the fine end of the paper cone so the icing comes out Various shapes can be made by varying the cutting, which is done with fine sharp scissors. Many persons may be surprised with the effects of this simple method of piping or ornamenting, and which they can easily try, and with a little ingenuity succeed in, so as to answer all the purposes of a family twelfth cake, or even produce sufficiently well formed designs on a wedding cake.

On Ices.

The consumption of ices in the United States is very large ; and it would be difficult to give even an approximate idea of the quantity used in the various parts of the country. The subject is therefore of sufficient importance to be treated upon in a work of this description, more especially as it has become an important trade, and one that principally applies to the summer time, when most confectioners in sweets have sufficient time to apply themselves to the manufacture of them. Ices are composed of all kinds of substances, juices of fruits, creams, liquors of all sorts, etc., prepared and congealed by means of broken rough ice mixed with salt. The freezing pot should be always of pewter, because it prevents the mixture from congealing too quickly, for on this depends the smoothness of the ices. Other vessels can be used, but the contents freeze so quickly that they have not time to get thoroughly mixed and smooth. Ices that are badly mixed and frozen become full of lumps, the sugar sinks to the bottom, and are a bad color. To make ices there must be a tub in which the freezing pots are placed in the midst of broken ice well mixed with several handfuls of common salt, sold for the purpose. These must be thoroughly well incorporated, or the mixture will not freeze. The pot being placed in the middle of the ice up to the cover, pour into it the mixture you intend to freeze, which you can make agreeable to the palate by tasting previously; then turn the pots round rapidly in the ice, by the handles at first, but after it is frozen a little it can be done better with a pewter paddle sold for the purpose, with which the sides must be kept continually scraped down, and the pots kept whirling round. As you must previously have taken the lids off to do this you will perceive the cream or custard begin to set, and greater rapidity of action must then be used, as upon the great agitation and well mixing depends the quality of the ices. It will be easily perceived when this operation is completed, by the stiffness which ensues. It can then remain in the tub till wanted.

NOTE.—In mixing the rough ice, mind it is broken small enough, and use plenty of salt, or it will not freeze well.

Imitation Cream Ice (or Frozen Custard.)

To a quart of milk put six eggs, half a pound of loaf sugar, and one ounce of fresh butter. Keep whisking it altogether on a moderate fire till it nearly boils, but not quite, or it will curdle. This you must watch closely. When it becomes thick, immediately take it off. Strain it through a hair sieve. Give it what flavor is required; vanilla is mostly preferred. When cool freeze it as described. Some tinge it with a little saffron water, which makes it look very rich.

The above may be colored with cochineal, and flavored with raspberry jam or juice for raspberry creams, and the same for other flavors.

The best ice creams are made with either half cream and half best new milk or all cream, according to the quality desired, with the juices of fruits and other flavors, and sweetened to the taste.

Raspberry and Strawberry Cream.

Wash and strain either of the above over a pan and put sufficient to the cream to taste rich, add the juice of a lemon, color with a little cochineal, sweeten and put it into the freezing pot and work the same as previously described.

Vanilla Ice Cream

Is simply the essence of vanilla added to the sweetened cream to suit the palate; tinge with a little saffron water and freeze.

Chocolate Ice Cream.

Add to the pint of sweetened cream four ounces of the best chocolate dissolved in a little water, mix it well in and strain through a sieve; freeze it as above.

Coffee Ice Cream.

To the pint of sweetened cream add a cup of strong infusion of Mocha coffee, and proceed as directed to freeze.

Tea Ice Cream.

To the pint of sweetened cream add a cup of strong tea and act as before.

Note.—Any description of the cream ices of whatever flavor can be produced by similar processes to the above.

Water Ices—Lemon Water Ice.

Take any number of lemons, squeeze the juice out, rasp some of the peels and mix it with syrup or sugar and water to the palate, strain through a sieve to keep out the pips, etc., beat the whites of two eggs and put with it, which gives body and makes it soft; freeze the whole as directed before.

Orange Water Ice.

Precisely as above, but no eggs, rub some of the peels on sugar and dissolve that in the juice

Strawberry Water Ice.

Strain the strawberries through a hair sieve over a pan or basin, add to the juice clarified sugar water and lemon juice to the taste.

Note.—The directions given in the article on freezing must be carefully attended to in all water ices, or they will get lumpy, which they are more liable to be than the creams.

Raspberry Water Ice.

Proceed as in the strawberry; the juice of currants can be added with advantage to this.

For any of the Currant Water Ices.

Pick and strain your currants as directed through a sieve, and proceed as with the other descriptions above.

Pine Apple Water Ice.

Peel a pine apple, pound it and pass it through a sieve, add the juice of three lemons and clarified syrup with water to the taste, strain it off into the freezing pot and proceed as with other ices.

To preserve Oranges or Lemons whole.

Carve on the rind any device, such as stars, stripes, etc., but do not cut deeper than the white pith, put them into boiling water and boil them till the head of a pin will easily penetrate them. Then throw them into cold water, boil some loaf sugar to a thread as explained in the book, drain the oranges dry, boil them up half a dozen times in the syrup and put them aside; next day drain them from the syrup, add a little more sugar, boil it up and pour over your fruit; repeat this three days; the fourth add more sugar, and boil to a stiff thread, put in the oranges, boil them up, put them in glasses, and when cold tie them down.

To preserve a Pine Apple whole.

Break off the top and stem, prick it all over with a large needle, and boil it in water till tender, which can be tested with the needle, then place it in cold water; when cold drain it quite dry, boil sugar enough to cover it to the thread, and pour it over, and proceed for three or four days with the same process as in the last receipt for oranges, etc.

Orange quarters in Barley Sugar.

Peel and divide some fine St. Michael oranges, put them for a short time in the stove to get warm, boil some sugar to the caramel degree as explained previously in this book. Dip them into this so as to completely cover them. Then place them in an ornamented glass dish for dessert. This is a very simple and delicious preparation for the table, and is sold in the shops of the confectioners of Paris.

Paris Nogat.

Use a small copper pan, put into it eight ounces of powdered loaf sugar, place it on a moderate stove and melt the same, stirring it all the time with a small wooden spatula; when it is a brown color put into it three-quarters of a pound of blanched almonds well dried and cut into strips; mix them well in, and when the whole is a nice brown, pour it out on a marble or dish slightly greased with fresh butter, and spread it out with a palette knife with which it may be shifted to detach it while warm.

Raspberry Syrup.

Take any quantity of raspberries and put them into a pan in a warm place to ferment, which will take place in two or three days, then strain them through a jelly bag; to every pint put two pounds of loaf sugar, and boil it to 223 degrees; when cool bottle it for use.

Cherry Syrup.

Press Morello cherries through a sieve when quite ripe and obtain the juice from them; for every pint, boil two pounds of loaf sugar to the crack; add the juice and boil up, skim it; when cold bottle for use. The pulp can be made into a jam by following the directions given under the articles on jams and jellies.

Apple Paste for Ornamenting, etc.

Take any quantity of good juicy apples, pare and core them, boil them in water till quite soft, mash and pass them through a hair sieve, weigh the pulp and put it into a preserving pan, weigh the same quantity of loaf sugar and boil it to the feather, mix it with the pulp and boil it a short time, pour it out thin on sheets of tin, previously coloring some of it with carmine or cochineal; put it into a warm stove twenty-four hours; cut it into strips or other shapes to form knots or other devices; some may be poured into small moulds; these are often used for ornamenting twelfth cakes, etc.

Orange and Lemon Chips.

Take large lemons with thick rinds, peel them off in long strips with a knife, put them into cold water, boil them till tender and then place them into cold water again; when quite cold drain them dry, place them in a pan, boil enough sugar to cover them to a thread and pour it over them hot; the next day boil the syrup up again and pour it over them, repeat the process by adding more sugar a few times; the last time boil the chips up in the sugar, and they will be ready for use. If they are to be candied proceed as directed in the article on orange and lemon peel in a previous part of the book.

Cherries in Brandy.

Take fine Morello cherries, cut off nearly all the stems, wash them in cold water, drain them on a sieve, place them in glasses and cover with good strong brandy, make them air tight, after a month strain the cherries from the brandy, and add a quarter of a pound of powdered loaf sugar to each pint of the brandy; when melted strain through a flannel bag till clear, and again pour it over the cherries; in another month they may be used.

NOTE.—The covering pots or glasses of either Jams, Jellies, Marmalades, etc., before they are tied over with bladder or parchment, cut writing-paper to fit the interior of pots and rub over the paper two or three drops of salad oil.

APPENDIX.

Cocoa: its Varieties and their Characteristics; Chocolate and its Manufacture, including Chocolate Confections; Caramels, Nougats, Marshmallows, Burnt Almonds, Candied Nuts, and other Confections; comprising Receipts and Processes of Manipulation.

APPENDIX.

Cocoa, its Varieties and Characteristics.

CHOCOLATE is prepared from the cocoa bean, the seed of the fruit of the cocoa tree (*Theobroma cacao* L.), which is indigenous to tropical America from 23° northern to 15° or 20° southern latitude. It is cultivated in Mexico and, in other countries where the tree now flourishes; it has been naturalized, as in Asia: in the Philippine Islands, Java, and especially in Ceylon; in Africa: in Cameroon, Bourbon, San Thomé, and the Canary Islands. The chief source of cocoa at the present time are the British Colonies.

The gathering of the fruit is effected by means of a long rod at the end of which is a semicircular knife for cutting through the stalk. The fruits are then split in two, the beans separated from the surrounding pulp and spread out on screens to dry gradually upon a bamboo floor exposed to the sun. The beans after that treatment are generally subjected to fermentation. The fruit is gathered throughout the year; but the principal gathering is in February and July in Brazil; during March and April in Mexico. From the cocoa trees growing wild in the forests, fruit is gathered at all times of the year and taken to market by the Indians.

The reason why in many districts the beans are subjected to fermentation is because it has the effect of improving their flavor. In Jamaica the over-ripe beans are fermented in meal casks fitted with perforated bottoms, and lined with banana leaves. After the beans have been packed in the casks, they are covered with banana leaves and twigs, and then left to ferment for 60 hours. The fermentation goes on with evolution of heat proportionate to the quantity of beans, and according to the prevailing condition of the weather. A normal progress of fermentation is indicated when the interior mass of beans has, on the first morning after gathering, a temperature of 86° to 91° F., on the second day, 95° to 100° and on the third morning a temperature not exceeding 110°. If the outer shells are marked with large spots the heating has been too great. As a characteristic of sufficient fermentation the change in the color of the external layer of the seeds to a clear chocolate brown or brown violet may be relied upon. After the fermentation it is usual, in most plantations, to remove the adhering portions of pulp from the beans by washing. The beans are then allowed to dry in the air and are finally packed into sacks. Contact with metal is to be carefully avoided throughout the whole operation.

The question as to which is the best method of fermentation cannot be determined in the existing state of knowledge of the subject. However, no matter what method is employed, the practical result to be reached in the fermentation is, in any case, to convert the color of the beans, as far as possible, from a harsh red into a chocolate color or cinnamon brown, as well as to harden the shells or make them tough; also to improve the odor and flavor, besides destroying the fermenting power of the seed.

Commercial sorts of cocoa beans. The various sorts of cocoa met with in commerce are named according to the countries where they are growing, or the ports from which they are shipped. Though there are, in that respect, many kinds of cocoa, they may be classified under a few heads, since the produce of small districts is more or less mixed in the large warehouses. One of the most essential factors to be considered in judging of commercial sorts of cocoa, is the more or less favorable conditions under which the beans are gathered. That may vary considerably if the gathering is carried out during bad weather or is interfered with by the prevalence of political disturbances. The color of particular commercial sorts may, for instance, be much affected and present differences even in the same parcel. Moreover, cocoa from different sources may be mixed in the course of trade and, for these reasons, only general characteristics can be relied upon as being in some degree typical.

In enumerating the different commercial sorts of cocoa the chief point to be considered is the geographical source, and the former classification as "unfermented" and "fermented" cannot well be adhered to at the present time, since many varieties which were formerly unfermented are now fermented and carefully prepared.

American cocoa. Venezuelan and Ecuador cocoa. The beans from these two districts have always occupied a prominent position in the market. The finer sorts are seldom exported. The kinds that are distinguished are:

1. *Socomusco* from the province of Venezuela. The beans are small, very plump, and mark-

edly convex. Shell: bright and of a pale yellow color. Taste: free from acidity, mild and fatty.

2. *Esmeraldas*, from Ecuador. Beans: rather smaller, plumper, and of a darker color than the Soconusco, and they are very heavy.

The chocolate made from these two sorts retains the color of the beans, and is considered to be the choicest.

Caracas cocoa. This occupies the first place among the commercial sorts imported from Venezuela. It is employed in the manufacture of the finest qualities of chocolate. Beans: markedly convex; cotyledons: externally reddish brown, internally red brown. Mean size: 0.905 inch long, 0.591 inch broad, 0.315 inch thick.

Puerto Cabello cocoa. Beans: large, thick, ovoid, but slightly flattened. Shell: coated with an ochre-yellow earthy crust. Cotyledons: externally reddish brown, internally red brown. Mean size: 0.945 inch long, 0.591 inch broad, 0.315 inch thick. Taste: mild.

Ariba Guayaquil cocoa. Beans: very large, flat, triangular and of irregular shape. Shell: pale yellow brown, with earthy coating. Cotyledons: deeper colored externally than internally. Taste; slightly bitter. Mean size;

0.945 inch long, 0.591 inch broad, 0.236 inch thick.

Machala Guayaquil cocoa. This is one of the varieties richest in fat. Beans: flat, of irregular shape, with dirty brown colored shell. Cotyledons: externally dark brown, paler internally. Taste: bitter. Mean size: 0.866 inch long, 0.512 inch broad, 0.197 inch thick.

Surinam cocoa. From Dutch Guiana. Bean: large and dense. Shell: greyish brown, owing to a coating of grayish loam. Cotyledons: dark red brown. Taste: acrid bitter. Mean size: 0.787 inch long, 0.472 inch broad, 0.236 inch thick.

Maracaibo cocoa (Columbia, province of Culia). Beans: of medium size with smooth reddish brown dusty surface. Cotyledons: reddish brown or ochre colored, and generally resembling Caracas cocoa in appearance.

Berbice cocoa (British Guiana). Beans: small, externally gray, internally reddish brown, closely resembling Surinam but smaller, very rich in fat, and very brittle; when pressed between the fingers the shell is easily detached.

Essequibo cocoa (British Guiana). Beans: large, solid, internally dark reddish brown. They closely resemble Surinam cocoa, with which they are frequently mixed.

Brazilian cocoa. Marañon cocoa. Beans: small, elongated, slightly flattened, almost straight at one edge and strongly convex at the other. Cotyledons: dark red. These beans are very rich in fat.

Bahia cocoa. Beans: fat, triangular, bulging at the edge. Shell: cinnamon brown. Cotyledons: externally black, internally from blackish brown to violet with many pigment cells and lumps of fat. Mean size: 0.905 inch long, 0.551 inch broad, 0.157 inch thick.

Cayenne cocoa (French Guiana) is of inferior quality and rarely met with in commerce. Beans: hard, externally greyish brown, internally violet. Taste: very astringent.

Cuban cocoa. Beans of very unequal size, almost always flat, of poor appearance and irregular form. Shell: firmly adherent to the kernel and partly covered with dried fruit pulp. Cotyledons: of a dark violet brown color. Taste: agreeably bitter.

West Indian varieties of cocoa Haiti or Port au Prince cocoa. Beans: flat, egg-shaped; they are much used for mixing with those of the mainland to produce an inferior article. Shell: bright brown. Cotyledons: uniformly blackish brown. Taste: slightly bitter. Mean size: 0.905 inch long, 0.551 inch broad, 0.157 inch thick.

Trinidad cocoa. The cocoa grown in Trinidad is, together with that grown in Ceylon, of most importance in connection with the manufacture of chocolate. Three varieties are grown which are called *Calabacillo*, *Criollo*, and *Forastero.* Beans: very large, broad and flat. Cotyledons: internally blackish brown. Shell: yellowish brown, readily detached. Mean size: 0.984 inch long, 0.709 inch broad, 0.157 inch thick.

St. Domingo cocoa. Beans: very flat, of irregular shape. Shell: red brown. Cotyledons: externally blackish blue, internally of paler color. Taste: bitterish. Mean size: 0.866 inch long, 0.512 inch broad, 0.157 inch thick.

Guatemala cocoa is seldom met with in commerce. It is highly prized and considered equal to Caracas cocoa.

Martinique cocoa is rather inferior and used for mixing with better kinds.

Asiatic cocoa. The most important variety cultivated in Asia is

Ceylon cocoa. The characteristics of fine Ceylon beans are: Beans: oval and only slightly flattened. Shell: very thin, reddish brown, readily detached. Vascular bundles distinctly visible. Cotyledons: externally a fine red brown, internally much paler; the section is frequently whitish especially near the periphery of the seed lobes, very friable. Mean size: from 0.709 to 0.866 inch long, 0.472 broad, 0.276 thick. Taste: agreeably bitter.

In addition to the finer qualities of Ceylon cocoa, which generally command a high price, there are inferior sorts met with in commerce. They are mixtures of large and small beans. The cheapest and most inferior kind is known by the name of "native Ceylon." Its color is much inferior to that of the other kinds, it has scarcely any taste and frequently it has a tallowy smell which renders it unfit for the manufacture of chocolate.

Java cocoa. Beans: generally similar to Ceylon cocoa, but rather more round, the upper end being somewhat pointed, the lower end broad. Shell: readily detached, very thin, abundantly fissured, of a bright brown color, varying to dark brown. Cotyledons: generally of a bright red-brown color. Mean size: 0.905 inch long, 0.472 inch broad, 0.354 inch thick. Taste: agreeably bitter.

African cocoa. Cameroon cocoa. This variety will require many years of cultivation before it will be equal in flavor and aroma to the American cocoa. As a marketable article, at present it can only serve as a substitute for mixing with better kinds in the proportion of at the utmost from 6 to 8 per cent. in order to produce good chocolate. The characteristics of Cameroon cocoa are as follows: Beans: generally flattened. Shell: bright cinnamon brown, moderately thick, sometimes difficult to detach from the kernel. Cotyledons: of a fine dark violet color. Mean size: 0.827 inch long, 0.620 inch broad, 0.276 to 0.315 inch thick. Taste: rough and coarse.

Manufacture of Chocolate.

Chocolate is a mixture of cocoa and sugar made thoroughly homogeneous by mechanical treatment and to which usually spices and even cocoa butter are also added. The sugar generally amounts to rather more than one-half (60 per cent.) of the mixture. Spices such as cinnamon, vanilla, cloves, nutmeg, mace, cardamons, as well as cocoa butter, or perfumes like Peruvian balsam, are only added in small quantity so as to improve or alter the flavor as required. Recently the ethereal oils of the spices have been used for this purpose, as well as artificially prepared aromatic substances, such as vanillin for example. The finer qualities of chocolate contain only cocoa, sugar and spices, but flour and starch as well as other substances are frequently added to inferior sorts. The kinds of flour usually employed are wheat and potato flours, rice, starch and arrow root, dextrin, and less frequently, oat, barley, acorn, chestnut or rye flour. In certain forms of dietetic chocolate, the sugar, which is injurious to some invalids, is replaced by saccharin, leguminous flour from beans, peas or lentils is employed. To some kinds of cocoa powder up to 5 per cent. of oatmeal is added, which causes the preparation to thicken when it is boiled with water. In some kinds of fancy chocolate, harmless colors, tincture of benzoin, etc., are used.

Cleansing and sorting the beans. The operations, which are carried on in factories by means of machines of suitable construction, commence with a thorough cleansing of the beans from adhering dust and mechanically admixed impurities. For this purpose rotatory cylindrical screens of various construction, driven either by steam or water power are employed.

The screen consists of a wooden case fitted with a revolving cylinder covered with wire gauze and fed with cocoa beans from a hopper fixed above. While working the cylinder is made to strike at intervals against the fixed casing, and meanwhile a current of air is driven through the cylinder to carry away dust, while sand and stones are shaken out through the meshes of the wire gauze.

The partially cleansed beans are then transferred to another cylindrical screen, which sorts them into three sizes. The object of this operation is that in the subsequent roasting to which the beans are subjected, they should be all nearly of the same size to ensure uniform roasting. If beans of dissimilar size were treated, the larger ones would either be imperfectly roasted or the smaller ones would be over-roasted.

After the beans have passed through this screen, each portion is hand-picked and all worm-eaten or otherwise damaged pieces are removed.

Roasting the beans. This operation is carried on similarly to the roasting of coffee, but cocoa beans do not require so high a temperature. Roasting may be effected in the roasting drum either by direct or indirect exposure to a coal fire, or by gas with compressed air. The temperature in the interior of the drum should not exceed 266° F., and no empyreumatic vapors, as in roasting coffee, should be evolved.

The general precautions to be observed in roasting cocoa beans are as follows: 1. The beans should not remain too long in the roasting drum. 2. They should be kept in constant agitation, and for that reason the roasting apparatus is made movable on its axis. 3. The heat applied should be carefully regulated. 4. The roasted beans should be rapidly cooled in order to prevent loss of aroma caused by after-roasting.

In roasting over an open fire great care must be taken so that the beans are neither too little roasted nor too much, as in either case their value would be reduced. The art of controlling the roasting operation in a particular apparatus must be learned by the person conducting it, and it would be useless to prescribe definite instructions as to the duration of the roasting, or as to the degree of heat to be applied, because both would be affected by the quantity of beans operated upon, by the greater or less draught of the fire, as well as by the kind of beans to be roasted. The point of over-roasting is indicated by the development of a disagreeable empyreumatic odor, like that of roasted coffee; the husks become charred, the kernels crumble and are superficially charred. There is also a correspondingly increased sharpness in the taste, and at the same time a reduction in the amount of theobromine in the kernels, with an increased amount in the husks. The overheated cocoa fat is partially converted into acrolein, which communicates to the over-roasted beans its pungent empyreumatic smell.

The object of roasting cocoa beans is: To develop the aroma; to gelatinize the starch granules; to alter the astringent tasting constituent so far that the taste of the bean is improved; to render by the consequent drying, the husk or shell of the bean brittle and more easily removable, while the bean itself becomes friable.

Crushing, shelling and cleansing the roasted beans. In the case of all machines employed for breaking, shelling and cleansing the roasted cocoa beans, the first step is to reduce the beans into small fragments. The portions of husk detached in that operation are for the greater part separated from the fragments of kernel by a current of air driven through the apparatus in a direction opposite to that in which the beans travel through the apparatus. In this way the husks are made to pass from below to a receiver situated at a higher level.

J. M. Lehmann has recently succeeded in constructing a machine that fully satisfies all requirements. In this apparatus the cocoa is first fed to a crushing arrangement of regulated capacity. The fragments fall into a cylindrical screen, the first compartment of which removes dust, while the subsequent compartments sort the fragments according to their size. Under each compartment there is a shaking board traversed by a current of air driven along it, that is capable of being regulated so as to effect the separation of particles of kernel from the particles of husk which are of the same size but specifically lighter.

In the preparation of chocolate, and especially cocoa powder (easily soluble cocoa), it is important that the crushed material first yielded by the crushing machine should be again subjected to purification in order to separate the hard radicles which would be prejudicial in these respects. The gritty sediment from decoctions of cocoa powder made from shelled beans only consists of these particles.

Lehmann effects the removal of the radicles by means of a machine in which the finer siftings from the crusher are transferred to the feeding arrangement under which is fitted a small blower that removes any still remaining portions of husk. The cocoa together with the radicles falls upon a shaking sieve which allows the radicles and the cocoa particles of the same size to pass through it, while the larger particles of cocoa thus purified travel along over the sieve and fall into a bag hung at the end. The radicles and the particles of cocoa then pass along a cylinder with small cavities punched on its inner surface, and while the cocoa particles remain in these cavities during the rotation of the cylinder, the radicles being of more elongated form do not fit into the cavities are caught up by a separator and prevented from passing on. The cocoa particles are made to fall into a trough by a brush working against the cylinder and are carried away by a worm. This process goes on along the entire length of the cylinder in such a way that eventually the radicles and the cocoa particles are delivered from the machine separately.

Mixing different kinds of cocoa beans. In many cases chocolate is prepared by mixing two or more kinds of cocoa beans in order to produce by such a mixture a definite taste and certain qualities. Thus somewhat bitter varieties are worked together with sweet sorts, those rich in fat with varieties poor in fat, and highly aromatic ones with less aromatic ones. Nevertheless, as a general rule, for the preparation of the finest qualities of chocolate only the better sorts of beans should be employed, while in the manufacture of inferior qualities, mixtures of various sorts of cocoa may be used in proportions regulated according to their price in the market.

In many cases the proportions of such mixtures are kept secret by the manufacturers under the impression that they are important, and each maker has his own specialty in that respect. The following are examples of working formulas:

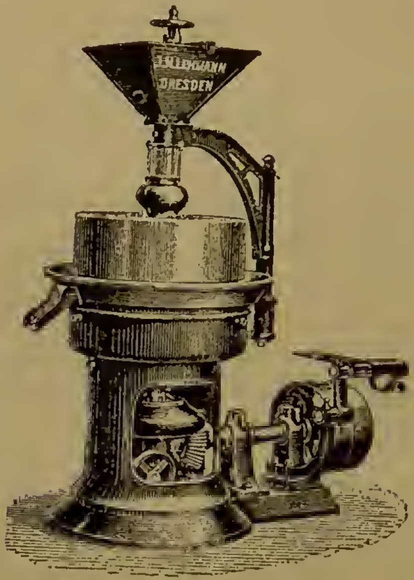
1. Caracas, Guayaquil, of each 1 part.
2. Caracas 1 part, Bahia 5 parts.
3. Maracaibo, Marañon, of each 1 part.
4. Trinidad, Marañon, equal parts.
5. Caracas 1 part, Marañon 5 parts.
6. Ariba 1 part, Surinam 1 part, Trinidad 1 part.
7. Ariba, Trinidad, Surinam, Caracas, of each 1 part.
8. Ariba $\frac{1}{2}$ part, Trinidad, Surinam, Caracas, of each $\frac{1}{6}$ part.
9. Machala, St. Thomé, equal parts.

Ceylon cocoa is but seldom employed for mixing, it being almost exclusively applied in making coatings in order to produce them as pale colored as possible.

The beans are weighed out in suitable proportions for the preparation of the cocoa mass.

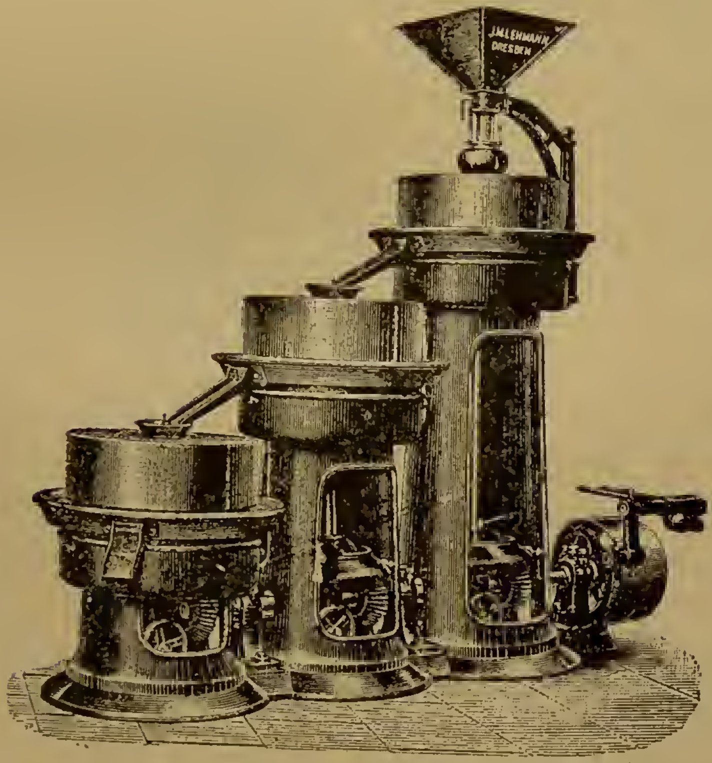
Trituration of the cocoa mass. Formerly the roasted, crushed and decorticated beans were frequently ground before being transferred to the incorporating machine or *melangeur*, which will be described later on, in which they were then reduced to a finer state of subdivision and finally mixed with sugar. But in the course of time the mills used for the preliminary grinding were replaced by the melangeur, by means of which the cocoa mass was reduced to the very fine state of division that is requisite in order to effect complete intermixture with the sugar to a perfectly homogeneous mass. At

Fig. 2.



the present time the kernels are ground so fine as to become semi-liquid, this object being effected by means of mills of the modern kind, two of which, constructed by Lehmann, are shown in Figs. 2 and 3. The use of these machines has the advantage of rendering the cocoa mass more easily miscible with the sugar on account of the liquid state to which it is reduced, and of effecting the mixture with sugar more rapidly.

FIG. 3.



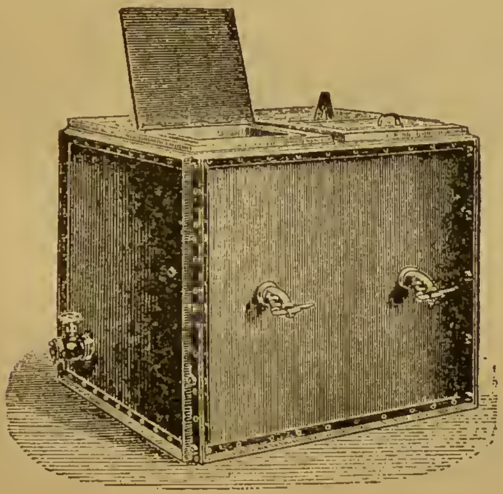
In the manufacture of chocolate the frequent passing of the material through the rollers is intended not so much to effect finer subdivision as to ensure the utmost intermixture of the component parts. The more time that can be devoted to the thorough mixing of the sugar and cocoa mass, the better the resulting chocolate will be. The triplicate mill shown in Fig. 3, satisfies probably all the requirements. It turns out cocoa in a state of extremely fine subdivision; it does not affect the aroma or flavor of the best kinds of cocoa, and it does not require more than from one to one and a half horse power to work it, or much attendance. The working of this mill is so conducted that the crushed cocoa is fed from the hopper to the upper pair of stones which have a disintergrating arrangement fixed in their centre. The cocoa prepared by that means passes between the surfaces of the stones and escapes in a semi-liquid condition. It is then carried by a channel to the second mill stones for further grinding, and is finished in the third pair, leaving the mill in a semi-liquid condition.

Cocoa mills with one stone as shown in Fig. 2 are applicable for grinding cocoa kernels to make chocolate mass, while the triple mills are more suitable for the production of cocoa powder.

Mixing the Ground Cocoa Mass with Sugar and Spices to Produce Chocolate.

In mixing chocolate it is of advantage to have the cocoa in a semi-liquid condition, and for that reason the ground cocoa coming from the mills is received in vessels heated by steam, Fig. 4, and fitted with suitable taps for drawing off the mass as it is required. Formerly the liquefaction was effected in the melangeur, the cocoa being fed into it in lumps. But in applying heat to the melangeur there was some risk of cracking the bottom plate, and at the same time the mixing was retarded. Now it is usual not only to warm the cocoa mass beforehand,

Fig. 4.



but also to warm the sugar by keeping it in hot closets so that the material operated upon in the melangeur has a uniform temperature, and loss of time is avoided.

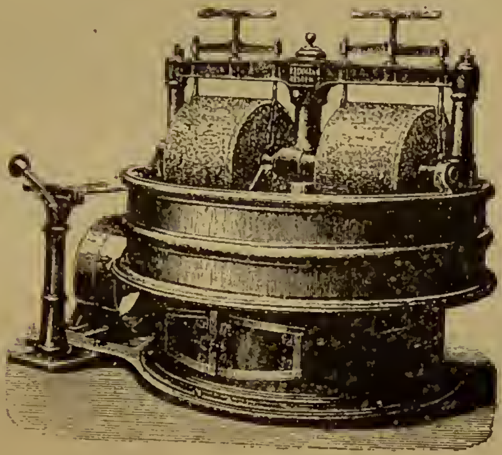
Cane sugar as well as beet sugar is used in chocolate making. Chocolate being naturally of a brown color, the cheaper semi-white kinds of sugar can be used as well as white sugar for mixing with the cocoa mass. The kinds of sugar used are: 1. Sugar dust, a white, crystallizable and very fine powder. 2. Sugar flour I, II and III, which is a sugar crystallizable with difficulty, containing an amount of molasses increasing with the number, and is more or less of a brown color.

The sugar required by the chocolate manufacturer should possess the following characteristics: It must dissolve in half its weight of water, forming a sweet syrup. The syrup must have no action on litmus paper, and on no account coagulate boiling milk.

The sugar is usually added to the cocoa mass in the form of a very fine powder. It must be perfectly dry, as damp sugar yields a dull chocolate which readily crumbles.

Trituration of chocolate mass. All the machines formerly used for this purpose have been replaced by the melangeur, which is capable of turning out a much larger quantity of material with a relatively smaller expenditure of power. Melangeurs are generally constructed on the same principle as the edge runner grinding mills used for various purposes, but they differ from them in so far as the bed stone revolves, while the runners merely rotate on their axis without revolving. Fig. 5 shows a melangeur with traveling bed stone, fitted with an arrangement for lifting out the runners. The bed stone as well as the runners are made of granite. Each runner has an axis working in pillow-blocks, so that it can be lifted out independently of the other. By this mode of construction the runners are prevented from taking an oblique

Fig. 5.



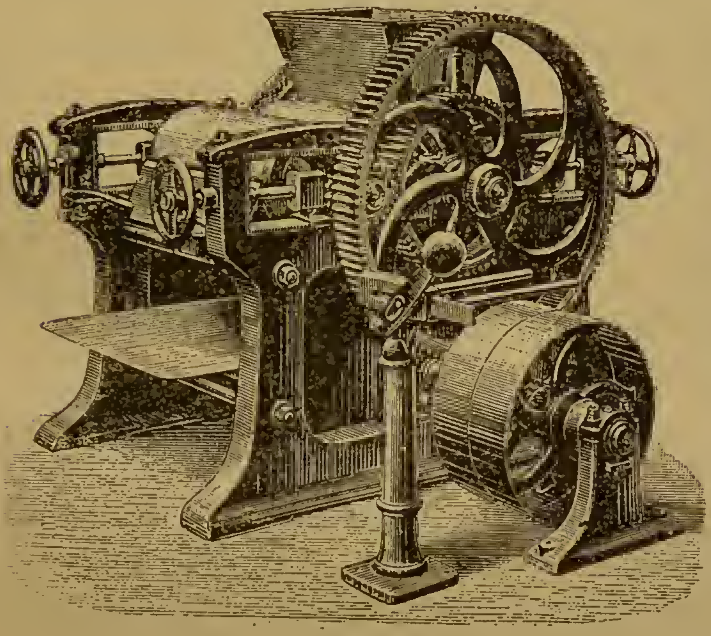
position. The contrivance for lifting out the runners prevents thumping upon the bed stone that otherwise might readily happen when starting the machine. The bed stone is heated by steam pipes from below. The emptying of the melangeur is effected, while the bed stone is revolving, by holding a shovel so that the cocoa is thrown against it.

The melangeur with revolving bed stone is equally adapted for mixing chocolate mass or for grinding cocoa powder. Another form of construction with fixed bed stone and revolving runner, according to the principle of the ordinary edge runner mill, is more specially suited for the preparation of cocoa powder and for working cocoa that has been partly deprived of its fat.

Levigation of the chocolate mass. The highest degree of subdivision and homogeneity of chocolate mixture is attained by the use of cylinder rolling mills. Every kind of chocolate must be passed through the rolling machine at least once or twice, even when finely powdered sugar is used in the manufacture. The best qualities of chocolate are passed through the machine six or eight times and even more. In the last of those operations the material is often fed into the machine in the form of blocks and rubbed down. The rollers are made of granite because of its hardness and other characteristics which make it suitable for that purpose.

Fig. 6 represents the most recent construction of roller machines. The axle biocks are fitted above to secure greater stability. The roller next to the blade has a reciprocating motion. The frame-work is made smooth without ornament so that the machine can be easily kept clean.

FIG. 6.



The addition of spices or ethereal oils, and of the substitutes for those additions, such as vanillin, is not made until the process of levigation in the roller machine has been nearly completed, the object being to prevent the loss of aroma that would be caused by long continued treatment of the material in the melangeur and the roller machine.

Proportions for mixing cocoa mass, sugar and spices. The relative proportions of cocoa, sugar, and spices, as well as of starch, flour or dextrine, are very different. Generally speaking 50 or 60 parts of sugar are added for 50 or 40 parts of cocoa mass. Below are given some formulae applicable for the production of the kinds of chocolate most used:

Hygienic chocolate. I. Cocoa mass, powdered sugar, equal parts of each.

II. Cocoa mass 4 lbs., sugar 6 lbs., starch, flour or dextrin 2½ lbs.

III. Cocoa mass 5½ lbs., sugar 5 lbs., starch, flour or dextrin 1½ lbs.

Spiced chocolate. I. Cocoa mass 8 lbs., sugar 12 lbs., cinnamon 2½ ozs., cloves 1⅓ ozs., cardamoms ½ oz.

II. Cocoa mass 8 lbs., sugar 12 lbs., cinnamon 4½ ozs., coriander ¼ oz., cloves ⅓ oz., oil of lemon 1 drachm, cardamoms ½ oz.

III. Cocoa mass 10 lbs., sugar 10 lbs., cloves ¼ oz., cinnamon 8¾ ozs., mace ¼ oz.

IV. Cocoa mass 10 lbs., sugar 10 lbs., cinnamon 2½ ozs., vanilla 2½ ozs., or vanillin 14 drachms, mace 30 grains, cardamoms 60 grains.

Spanish spiced chocolate. Cocoa mass 10 lbs., sugar 10 lbs., cinnamon 4 ozs., cloves 1¾ ozs., cardamoms 2¾ ozs., mace 1½ ozs., vanilla 1¾ ozs., or vanillin 15¼ grains, oil of lemon ½ drachm.

Vanilla chocolate. I. Cocoa mass 10 lbs., sugar 10 lbs., cinnamon 5½ ozs., vanilla 1¾ ozs., or vanillin 18½ grains.

II. Cocoa mass 9 lbs., sugar 11 lbs., cinnamon ½ oz., vanillin 23 grains.

III. Cocoa mass 3 lbs., sugar 12 lbs., cinnamon 4¼ ozs., cloves ¾ oz., vanillin 24 grains.

The powdered spices may be proportionately replaced by the corresponding essential oils, the amount to be used being a matter of taste.

The essential oils can be incorporated in the cocoa mass either in a spirit solution or rubbed down with sugar. The latter method is of course only used when sugar is to be added to the cocoa preparations. To prepare the alcoholic solution 10 parts of the ethereal oil are dissolved in 90 parts of strong alcohol. The mixture of oil with sugar may be made by triturating 2.5 parts of the ethereal oil with 100 parts of sugar in a porcelain mortar and rubbing down with the pestle until the sugar and oil are intimately mixed. Of the alcoholic solution 10 parts are required to equal 1 part of ethereal oil, and of the oil-sugar 40 parts.

Coloring materials. In Germany the following coloring materials are permitted, by law, to be used for sugar goods, and also for chocolate and cocoa preparations: *White:* Finest flour starch. *Yellow:* Saffron, safflower, turmeric. *Blue:* Litmus, indigo solution. *Green:* Spinach juice, as well as mixtures of the permitted blue and yellow colors. *Red:* Carmine, cochineal, madder red. *Violet:* Mixtures of the harmless blue and red colors. *Brown:* Burnt sugar, licorice juice. *Black:* Chinese ink.

However, there is no ground for objecting to a number of comparatively harmless aniline colors and a list of them is given under their commercial designations:

Red: Fuchsin; acid fuchsin or fuchsin S or rubin; roccelin or roscellin (fast red); Bordeaux or ponceau red; eosin; phloxin; erothrysin.

Blue: Alazarin blue; aniline blue; water blue; induline.

Yellow: Acid yellow R or fast yellow R; tropaeolin OOO or orange I; naphthol yellow.

Violet: Methyl violet.

Green: Malachite green.

Removal of air and division of the chocolate. The chocolate that has been through the rolling process is kept in the hot closet until it can be moulded, but before that can be done the air introduced in working the paste must be extracted and the mass cut up into small portions. For these purposes the mass has first to be kneaded in a melangeur, with a dish-shaped bottom, until it has the requisite plasticity. For convenience of working the melangeur is provided with only one runner. Between the bottom and iron jacket is water which can be heated by steam pipes so as to warm the stone uniformly without danger of cracking it. After being worked up the mass is taken out in large lumps, and in order to bring it to the proper temperature—about 80° or 90° F., according to the season—for extracting the air, it is spread out upon tables of hard wood, marble or iron to cool sufficiently. When the lumps have attained the proper temperature they are transferred to the machine for extracting the air. The machine used for this purpose admits of being warmed by a charcoal fire or other suitable means. The chocolate mass passes through the machine and escapes from it in a cylindrical form almost free from air and is received upon a traveling band. As the mass is forced out it is cut off by a knife, so as to divide it into pieces of the weight required for moulding.

Moulding chocolate. The pieces thus cut off to the required weight are placed separately in iron moulds which must have the same temperature as the chocolate mass. The temperature requisite for moulding smaller cakes is from 80.5° to 90.5° F., while with larger pieces it may be kept much below that.

Chocolate is sold in two principal forms, namely, in that in which it is used for domestic purposes and in that in which it is consumed as an article of luxury. The kinds belonging to the first class come in pieces weighing from two ounces to several pounds. The moulds are made of tin plate and generally have a capacity greater than necessary for holding the particular quantities to be moulded. The pieces of definite weight deposited in the moulds are spread out by hand, and the moulds are then placed upon the shaking table, where the soft mass is soon made to sink into all the depressions of the mould. The removal of the cooled cakes is readily effected by pressing the mould diagonally. Knocking the moulds at the back is unnecessary, and it only destroys the moulds.

The moulds are generally made with from four to ten ridges so that the chocolate can be easily broken into pieces of convenient size as required for use. Any kind of inscription, such as the name of a firm, may be reproduced on the cakes of chocolate by stamping it upon the moulds.

Moulds for small tablets, sticks, etc., are made of tin plate and the several parts are enclosed in a stout iron frame, the upper side of which is ground down smooth so that any superfluous portion of the filling can be easily scraped away. In that way from six to thirty pieces can be cast in one mould at the same time. The cooled chocolate falls out of the mould when one corner is gently tapped against the table.

Chocolate and Other Confections.

Chocolate cigars are made either by placing the chocolate mass between two halves of the mould which fit together exactly, or by pouring the melted mass into a hollow mould. When working on a large scale moulding presses are used for this purpose. Other figures, such as fish, etc., may also be produced by means of the moulding press, by using stamped moulds in the same manner.

Chocolate eggs are generally made hollow, unless they are very small, by pressing chocolate in two halves of an egg-shaped mould, and then uniting the two parts.

Various figures, fruit, animals and other small objects. Double moulds are used for making these objects in chocolate, the moulds consisting sometimes of three or four parts. They are made either of tinned sheet iron, or for more complicated forms are cast in tin, but the latter are not so durable as those of tinned sheet iron with strong iron frames.

Soft chocolate having been pressed into the several parts of the moulds, the latter are put together, and excess of material is removed by pressure in a suitable press. After cooling, the moulded objects are readily detached from the moulds, and they require only to be scraped clean, or further ornamented as may be desired. This is done in various ways, for example by painting with colored cocoa butter.

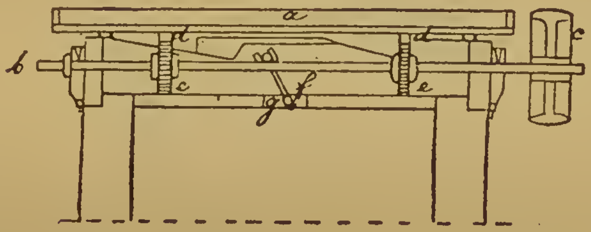
Small sticks, tablets, fruit or figures filled with cream are prepared by placing the cream contents in moulds of wood or sheet iron, dusted with flour, and then moulding round them chocolate that must contain sufficient cocoa butter to be readily kept soft.

The shaking table. The pasty chocolate mass spreads itself spontaneously in the moulds, but to make it penetrate to all parts of the mould and to get rid of any bubbles of air that may remain in it, the moulds when filled with chocolate are subjected to a sharp oscillatory motion.

This is effected by means of the shaking table upon which trays containing a number of filled moulds are placed. A typical form of such a table is shown in Fig. 7.

The movable slab *a*, fitted with an upright rim at its edges, has underneath two projecting pieces *d*, working against deeply toothed wheels *e*, which revolve with the shaft *b* driven by an endless band on the pulley *c*. As the shaft revolves, the teeth of the wheels *e* act upon the projecting pieces fixed under the slab, pushing them on one side, so as to raise the slab with a jerk until the ends of the teeth in contact with the projecting pieces pass over them and the

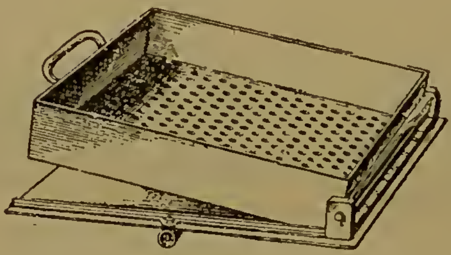
Fig. 7.



slab drops down as much as it has been raised. Each tooth of the wheels coming in contact with the projections repeats this motion of the slab, causing it thus to oscillate up and down. To stop the motion of the slab, the wheels can be thrown out of contact with the projections by a lever fitted at *g*, and without stopping the rotation of the shaft *b*.

Chocolate lozenges and pastilles. These articles are generally made with cocoa mass, sugar and spices, and an apparatus similar to that shown in Fig. 8 is used for the purpose. The chocolate mass is made to penetrate through holes in a plate until small lumps of it project upon a slab beneath. After sufficient chocolate has passed through, the box is raised on its hinge and the pieces of chocolate left upon the slab. By means of gentle shaking, these pieces take the required form, and are then cooled and detached. The coating of lozenges with colored

Fig. 8.



sugar is effected by passing them together with the plate to which they adhere through a box containing the sugar dust.

Pastilles, on the surface of which impressions of various kinds are required, may also be made by placing the soft chocolate mass upon slabs in which depressions are stamped that will produce the required device on the surface of the pastilles. To make the chocolate mass fit into the depressions a roller is used, and the superfluous material is removed with a knife. Pastilles of this kind are rendered perfectly sharp in the moulding only by subjecting them before cooling to the described manipulation on the shaking table.

Sweet chocolate. Sugar 5 lbs., glucose 1¼ lbs., fresh butter ½ lb., pure cocoa unsweetened 1 lb., essence of vanilla ¼ oz. Put the sugar, glucose and water in a clean pan over the fire and stir occasionally until it boils. Put on the lid for five minutes, then remove the cover and see that the sides of the pan are free from sugar. If not, rub it round with a damp cloth or sponge. Then boil until it reaches the degree of thread (230° F.), add the cocoa paste in small pieces; keep stirring until the degree of a soft ball (240° F.) is reached. Take the pan from the fire and pour in the vanilla flavor and stir the mass until it gets quite stiff. Pour out in greased tins.

Cream for chocolate creams or bars. White sugar 5 lbs., glucose 1¼ lbs., water 1½ pints. Put the sugar, glucose and water in a clean pan and boil until the mass reaches the degree of feather (235° F.). Keep the sides of the pan free from sugar. Pour out on a damp pouring plate, and let it remain till nearly cold. Then with a long palette knife or spatula, commence to rub the sugar against the plate, and work it about until it changes from a clear syrup to a snow-white creamy mass. Then knead it with the hands until of uniform softness and no lumps are left in it. It is now ready for use and may be kept covered in stoneware jars until required for the various purposes. In winter the sugar need not be boiled so high, in hot weather a little higher. When packing the cream away in jars, it is better to keep the top moist by laying on a damp cloth before putting in the cork.

Chocolate cream roll. Sugar 5 lbs., glucose 1¼ lbs., water 1½ pints, essence of vanilla ¼ oz. Prepare the cream in the manner given above, but boil the syrup up to a strong thread (250° F.), and add the flavor. When creamed, break off portions and roll them to the desired thickness. Keep them on the move until they become firm enough to their shape. Have ready a quantity of melted chocolate into which dip them once, twice or three times according to thickness of coating wanted.

Chocolate cream bars. Use cream prepared according to directions given above. Fit greased paper neatly around the sides and bottoms of tins with edges 1½ inches deep. Melt some of the cream on a slow fire, flavor with vanilla as soon as the cream is sufficiently melted. Then pour the contents of the pan into the tins to make a sheet about 1 inch thick or less. When set, carefully empty, so as not to break the cake. Have ready some melted chocolate and, with a soft brush, coat the cream on both sides. Lay the cakes on wires till cold and set, and then cut up into bars of required size, using a knife with a thin polished steel blade having a good edge.

Moulded chocolate cream bars. Moulds for chocolate are made either in tin or copper moulds of different devices, and generally to a size so that, when filled, the bars would weigh ¼ or ½ lb. net.

To make these cakes first melt some sweet chocolate paste and pour it into the tins, about ⅛ inch thick or less. Turn the moulds about so that the chocolate may cover them all over. When set fill up the moulds with melted cream flavored with essence of vanilla. Allow them to stand till cold and hard, then with a brush cover the cream with a little melted chocolate. In a few minutes the cakes may be turned out of the moulds. If the chocolate paste is of good quality and evenly melted, it should carry a good gloss on its face. However, if too dull, go over it with a camel-hair brush dipped in a solution of shellac in alcohol.

Nougatines. Ground almonds 4 lbs., sugar 7 lbs. Place the sugar (without water) in a bright pan over a moderate fire and keep stirring until melted. See that the sugar is well scraped down from the edges so that it gets all melted. When it becomes a rich brown, sprinkle in the ground almonds, and stir just sufficiently to keep the almonds from the bottom. When the almonds are boiled in and thoroughly incorporated, remove the pan and pour the contents on an oiled slab. When cold enough to handle, turn the mass up as if for drops, and pass through a machine or snip off with scissors. Sift the nougatines and cover them with a thin solution of gum, and throw them into a heap of icing sugar and mix them up till well coated. Finally remove them to the drying room for twelve hours, when they are ready for packing.

Chocolate nougatines. Exactly as the preceding formula. When shaped by rollers or by hand the nougatines are dipped into melted chocolate, taken out with a fork and spread on trays till dry.

Chocolate cream drops. If the cream for this purpose has been prepared according to the method given under "Cream for chocolate creams or bars," starch moulds are required, which are made as follows: Several shallow boxes are filled about an inch deep with powdered starch perfectly dry. The top surface is made even and smooth with a straight stick. Into this starch powder or flour press any pattern desired, and repeat as often as convenient. A quick way is to have a number of patterns glued or fastened to a long stick so that a whole row of them can at one time be impressed upon the powdered starch. Lift your pattern up perpendicularly so that you have a clean mould. The starch moulds being now ready, pour the melted cream into them, and in one hour it will be set hard enough to allow of being taken from the moulds. Clean the drops with a soft hair brush when they are ready for coating. Warm some sweet chocolate paste until melted and then drop the creams into the melted chocolate, two or three at a time. Lift them out with a long fork, place them on glazed paper or sheets of tin to dry, and put them in a cool place to harden.

There are several other methods of making the cream, especially in small establishments where sugar boiling is not usually done. One of these methods is as follows: Dissolve ½ lb. of picked gum arabic in 1 pint of hot water and add a sufficient quantity of fine sugar, sifted through muslin, to make a stiff paste or dough. Knead the paste thoroughly but lightly with the hands and flavor with vanilla.

Another method is to make the cream of white of eggs and sifted icing sugar and water, omitting the gum. Take the whites of six eggs, beat them up with one gill of water and mix with the sugar flavored with vanilla until it makes a stiff mass which is thoroughly kneaded with the hands. To cheapen the cream corn-starch may be added which saves both eggs and sugar, but the resulting cream is not so sweet.

The cream prepared according to either method is divided into equal portions by being forced through the tube of a small sausage-stuffer or a machine called a biscuit-forcer, and cut off into equal lengths. The creams thus obtained are lifted on the end of a fork, placed in melted chocolate and rolled about in it until fairly covered with it and set upon glazed paper or sheets of tin to dry.

Chocolate for dipping is so often required for many different purposes that a good general receipt will not be out of place. If the instructions are followed and a little discretion used with the colors, a light, glossy chocolate coating will result:

Pure chocolate 1 lb., white wax 3 ozs. Put the chocolate in a saucepan and set it on the stove or near a fire. Break up the wax into small pieces and stir it in until all is melted. Then add some chocolate brown color together with a little liquid cochineal, stirring the whole till thoroughly mixed, when it is ready for use. For cheaper goods more wax may be used. When mixing in the coloring, try a little on a piece of white paper until satisfied with the result.

Caramels.

Chocolate caramels. I. Sugar 3 lbs., glucose 2 lbs., sweet cream 1 quart, fresh butter ¾ lb., pure chocolate, unsweetened, ¾ lb. Put the sugar and cream in the pan, stir it well together and then add the glucose. Let it boil to a stiff ball. Ease the pan off the fire a little, put in the butter in little pieces, and then the chocolate, stirring the whole well together. Bring the mass to the boil and then add extract of vanilla. Remove the pan from the fire and pour the contents on an oiled slab, making the sheet about ½ inch thick. Mark deep with the caramel cutter, when set; divide with a sharp knife, and wrap in wax paper.

II. Sugar 5 lbs., fresh butter ¾ lb., pure chocolate unsweetened ¾ lb., cream of tartar ½ oz., fresh milk 1 quart. Melt the sugar in the milk, add the cream of tartar and boil to the degree of ball. Ease the pan a little off the fire and stir in the butter and chocolate. Bring the whole to the boil, add extract of vanilla, then remove the pan, and pour the contents on the slab. Mark and separate as above.

Vanilla caramels. I. Sugar 3 lbs., sweet cream 1 quart, fresh butter ¾ lb., glucose 2 lbs. Put the sugar, glucose and cream in the pan over a slow fire and stir constantly. Boil to a stiff ball and then add the butter. Keep stirring and when it has well boiled through remove the pan from the fire. Flavor with vanilla essence. Pour out on oiled plate and when set, mark with the caramel cutter. When cold divide with sharp knife and wrap each caramel in wax paper.

II. Sugar 5 lbs., fresh butter 1 lb., new milk 3 pints, cream of tartar ½ oz., water 2 pints. Boil the sugar, milk and cream of tartar on a slow fire, stirring all the time until it reaches a stiff ball. Flavor with essence of vanilla and stir gently. Remove the pan from the fire and pour the contents on the oiled slab and when set, mark deep with the caramel cutter. When cold separate the squares with a sharp knife. These caramels should be a cream color.

Raspberry caramels. This flavor may be employed in either of the last two receipts, or the following receipt may be used:

Sugar 4 lbs., glucose 1 lb., fresh butter ½ lb., raspberry pulp or jam ½ lb., condensed milk 1 can, water 1 pint. Boil the sugar, glucose and water to degree of ball (250° F.), move the pan to one side of the fire, add the milk, butter (cut small) and the jam. Stir the whole together and replace the pan on the fire. Add sufficient liquid cochineal color and keep stirring the whole time while boiling. Then pour the contents of the pan on the oiled slab. When set mark with the cutter, divide the squares and wrap when cold.

Cocoanut caramels. Sugar 4 lbs., glucose 1 lb., fresh butter ½ lb., desiccated cocoanut unsweetened ¾ lb., condensed milk 1 can, water 1 pint.

Dissolve the sugar in the water, add the glucose, and boil up to ball (250° F.). Remove the pan to one side, then stir in the butter, milk and cocoanut; bring through the boil. Pour out on oiled slab or in frames about ½ inch thick. When set mark with the caramel cutter and when cold separate the squares and wrap in wax paper.

Maple caramels. By using maple sugar, maple caramels may be made precisely as vanilla caramels. The flavor of the maple sugar is sufficient and requires no additional essence. The following receipt may also be used:

Yellow sugar 2½ lbs., maple sugar 2½ lbs., cream ½ pint, butter ¼ lb., water 1 pint. Boil the sugar and water to the crack, add the cream and boil up again to the crack. Then add the butter and bring once more to the crack. Pour out and divide as usual.

Walnut caramels. White sugar 4 lbs., glucose 1 lb., fresh butter ½ lb., shelled walnuts, broken small, ½ lb., condensed milk 1 can, water 1 pint. Proceed as for raspberry caramel, but in place of liquid cochineal color, color with saffron.

Candies.

Cream candies are candies made of worked sugar properly flavored. When well made and carefully cut up they make a nice show and are quite in demand. Many flavors and colors of pleasant taste and pretty tint are adaptable for this class of goods. Below a few formulae are given:

Walnut cream candy. White sugar 8 lbs., glucose 3 lbs., shelled walnuts 2 lbs., desiccated cocoanut medium 2 lbs., water 1 quart, vanilla flavor. Boil the sugar, glucose and water at 340° F., then lift the pan off the fire and stand it aside until the syrup gets quite cold. Now place the pan again on a slow fire and with a spatula commence to move about this now thick heavy syrup until it thins a little and gets as warm as you can bear your fingers in it (not hotter). Then again remove the pan from the fire and work the mass with the spatula until it commences to get white and creamy. Now add the desiccated cocoanut and sufficient essence of vanilla to flavor, still working up until the cocoanut is well amalgamated, then stir in the walnuts, and beat up quite stiff. Now remove with the hands one-third of the whole into another pan or dish and color this portion red. When the color is well mixed in, have a frame of suitable size, about four inches deep, lined with wax paper. Lift out the boil and fill the frame, mixing alternately, two parts white and one part red, not in layers, but the red portion promiscuously; let it stand over night. Next morning cut it into bars with wire. It should look very nice, the red showing in streaks.

Cherry cream candy. Sugar 8 lbs., glucose 3 lbs., desiccated cocoanut medium, glace cherries 1½ lbs., water 1 quart, vanilla flavor, red color. Proceed same as for walnut cream. When the boil has creamed add the cocoanut, mix well in, then add the cherries and vanilla flavoring, mixing and beating the whole thoroughly. Now remove half the boil into the prepared frame and color the remaining half to a bright pink, put it on top of the white portion already in the frame, and cut into bars next morning.

Indian cream candy. Sugar 8 lbs., glucose 3 lbs., desiccated cocoanut medium 2 lbs., water 1 quart, red coloring, vanilla flavor. Proceed exactly as before, boiling to 240° F. Remove the pan from the fire and let the syrup stand till quite cold; then replace the pan on the fire and stir until the syrup gets thin and as warm as new milk. Now add the cocoanut and vanilla flavor, and cream with the spatula, beating up the whole well until creamy and stiff. Now divide the boil by removing one-half to a table covered with wax paper, and color the other half, left in the pan, to a bright red, and turn it also on to the table, but apart from the white heap. Let both lots stand one hour or so; then with the hands take, say, half a pound of the white cream, mould and shape it like an egg, then take sufficient of the red cream, mould it out and cover the whole white portion over with it. Continue the process until the boil is worked up and let the blocks stand to set for some hours. When moulding the cream keep the hands well dusted with flour.

Cream chips. Sugar 9 lbs., glucose 3 lbs., desiccated cocoanut slices 3½ lbs., water 1 quart, vanilla flavor. Proceed same as for walnut cream. When the cold syrup is placed on the fire the second time, be careful not to overheat it or you do not get a nice cream. When the cocoanut slices are added, stand the pan in a secure place, and beat up the cream well, rubbing it now and then against the side of the pan until it turns white and creamy. Now stir the whole batch together and turn it out into the frame. Then proceed again with a boil half the size in every ingredient, and when the cocoanut slices have been added, color to a bright pink, flavor with vanilla and cream well; then pour this boil on top of the white batch. Let the whole stand in the frame for twelve hours and cut up into convenient size.

Cream candy (*white*). Boil 10 lbs. of crushed loaf sugar with three pints of water, then add half a teaspoonful of cream of tartar. Place the pan on the fire and bring the syrup to a boil. When all the lumps are properly dissolved add 1 lb. of glucose. Now let boil for 10 minutes, then add 1 lb. of fresh butter. When putting in the butter, the boil will froth up, so that the pan must allow of this, or the sugar will boil over. Boil the ingredients to the first stage of crack at which point the mass will be ready. Oil your slab and pour the boil on it. As soon as possible turn it up and work it until stiff enough to pull on the hook. Pull it until it gets a pure white. It may now be either made into twisted sticks or bars.

Candy pulling may be done by the hand, well oiled with sweet oil or butter, when the quantity is small, or on a large hook placed at the height of the eye. This hook should be blunt and large enough to admit with ease rolls four or five inches in diameter. Roll the candy upon the slab so as to be in convenient form for throwing upon the hook, throw it up, and catching both ends gently pull the candy towards you, standing some three and a half or four feet from the hook. As the candy lengthens out as far as is safe, bring both hands together and throw back over the hook the doubled strand of candy, so to speak, which has just been pulled out. This is continued until the candy is white enough, when it is taken off the hook and formed into such shape on the slab or otherwise as is desired.

Molasses candy. Bring 1 quart of molasses into a four quart boiler and boil over a slow fire for 25 to 35 minutes. After boiling for twenty minutes take out a small portion on the end of a spoon and test it by dipping into cold water. If it hardens quickly and breaks short between the teeth it is sufficiently boiled. Put in half a teaspoonful of baking soda, stir thoroughly and pour out into oiled or buttered tin. When somewhat cooled take up the candy with your hands, well oiled, or buttered and pull it, according to the directions given above, until it is white or whitish yellow, in which condition it is old-fashioned molasses candy.

The candy known as "*Yellow Jack*" is old-fashioned molasses candy cut in strips and rolled or twisted.

Walnut molasses candy. Shake kernels of black walnuts in a sieve to clear them as much as possible of their skins, put them into a pan and pour over them sufficient molasses boiled as for molasses candy to cover them. Stir thoroughly and pour into square pans an inch or an inch and a half deep. Allow to cool nearly, and then divide it into strips with a knife.

Peanut candy. Use fresh roasted peanuts freed from their inner skins by tossing them in a sieve. Then proceed as for walnut candy.

Honeycomb or sponge candy. Put 4 lbs. of crushed lump sugar with 1½ pints of water in the pan and boil to the crack. Have previously prepared 2 teaspoonfuls of fine powdered sugar mixed with the white of one egg, well beaten and stiff. When the sugar is at the crack, lift the pan off the fire and pour in the egg and sugar and color and flavor as desired. Stir the whole up at once with the spatula. In a short time it will rise, but it must be allowed to fall again. Continue to stir until it again begins to rise. Place a frame, either wood or iron, about 8 inches square on a wet slab, and pour the boil into it.

Molasses cocoanut. Boil molasses 2 lbs., brown sugar of good quality 2 lbs., glucose 2 lbs., a teaspoonful of cream of tartar and grated cocoanut 5 lbs. to a strong ball. Keep stirring continually and when done pour upon a greased slab.

Transparent malasses candy. Put 5 lbs. of brown sugar in the pan with the usual quantity of water. When the sugar boils add two tablespoonfuls of good pale vinegar, and continue boiling to the crack. Then pour into greased tins about 1 to 1½ inches deep.

Butter scotch. White sugar 4 lbs., fresh butter ½ lb., cream of tartar ⅛ oz., water 1 pint. Melt the sugar in the water in the pan over a fire, stirring occasionally; then add the cream of tartar and boil up to 300° F. Lift the pan on the side of the stove and add the butter in small pieces. Replace the pan on the fire, add lemon flavoring and let it boil through so that all the butter is boiled in, and then pour into frames. When partly cold mark with cutter into small squares, and when quite cold, divide the squares.

Fruit candy. Shelled walnuts, shelled Brazil nuts, almonds blanched and slightly roasted, glacé cherries, sliced cocoanut, of each ½ lb., sugar 4 lbs., glucose 2½ lbs., citron peel, cut in pieces, ¼ lb. Dissolve the sugar and glucose in water, boil to 290° F., remove the pan from the fire, and stir in the mixed fruits. Then replace the pan on the fire and after the contents have been warmed through pour them out on an oiled plate. Mark while warm into bars and break up when cold.

To blanch almonds. Put the almonds in a pan or other vessel and cover them with sufficient boiling water. Stir carefully, and in a few minutes the skins will peel off easily by squeezing the almonds between finger and thumb.

Peppermint candy. White sugar 4 lbs., glucose 1 lb., water 1½ pints. Mix the sugar with the water, place the pan on the fire, add the glucose and boil to a weak crack (300° F.). Pour the batch on an oiled slab, add peppermint flavoring, turn up the edges, and mix in. Then commence to draw the mass out, double it up, and pull out again, repeating this process on the slab a few times till the sugar gets a little tough. Then throw the lot over the hook and pull until it becomes white and spongy. A tinge of blue before pulling will improve the color. Remove the boil to the slab and roll out into sticks.

Plaited peppermint candy. White sugar 4 lbs., glucose 1 lb., water 1½ pints, essence of peppermint ⅛ oz. Boil the sugar, water and glucose in the usual way, to the weak crack (300° F.), pour out on an oiled slab, add the essence of peppermint and mix up till stiffish. Then pull the mass over the hook until it becomes spongy. Remove it to the slab, roll and pull out in sticks 1½ inches thick, cut into equal lengths, take hold of three sticks and plait with the fingers while the sugar is still pliable. It is advisable to keep the bulk of the boil on a piece of hard wood during the process unless there is an assistant to do the plaiting. The sugar keeps soft and pliable for a longer time on wood.

Nougats.

Nougat. Sugar 3 lbs., glucose 2 lbs., the whites of 8 eggs, almonds, blanched and dried, ¾ lb. Dissolve the sugar and glucose in sufficient water up to a temperature of 253°. Stir the mixture one minute to let the heat out, have the whites of egg well beaten and add them together with vanilla flavoring, beating the whole well together with the spatula until quite stiff. Now take one-third of the batch and place it in a frame lined with wax paper and spread one-third of the almonds on top; then color the remainder of the batch a light pink. Divide this lot into two portions and spread one portion on top of the one already in the frame and sprinkle more almonds over the top of the layer. Now color the remaining portion of the pink a dark brown adding a small piece of pure chocolate and the remainder of the almonds, mixing all together and spread on top of the pink layer, smooth over and cover with wafer paper. Let it stand three or four hours and cut up.

This same receipt will stand for vanilla, strawberry and chocolate nougat made separately. Proceed in the same manner, only mix in the almonds with the whites of egg when beating up.

Vanilla nougat. Sweet almonds, blanched, 7 lbs., white sugar 2 lbs., clear honey 1½ quarts, whites of 12 eggs, glucose 1 lb., essence of vanilla ½ oz. Beat the whites of egg to a thick froth. Place the sugar, honey and glucose in a bright clean pan over a very slow fire and stir continuously with a wooden spatula for about two hours until the mass gets thick; then add the beaten whites of egg and continue to stir until the mixture reaches the degree of stiff ball. Now put in the almonds and essence of vanilla, stirring them well into the mass. Next remove the pan from the fire and pour out the contents on wafer paper, spreading them out a full inch thick. Cover the top also with wafer paper and smooth the entire sheet level. Keep a flat board on top until cold and set. Remove the board and cut into bars.

Marshmallows.

Marshmallows. Pulverized sugar 5 lbs., glucose 5 lbs., gelatine 5 ozs., water 1 quart. Soak the gelatine in hot water until dissolved and put it aside. Now put the glucose in the boiling pan and place on the fire (without water). Stir until it melts and boil to 248° F.; then remove the pan from the fire and stir in the pulverized sugar. Now pour into the batch the dissolved gelatine and flavor with vanilla. Then put the lot into a beater and beat well until stiff. Pour the batch back on the slab, which should be well sprinkled with pulverized sugar. Spread out the batch evenly and sprinkle more pulverized sugar on top. Let stand for three or four hours, and cut up into squares.

Opera cream caramels. Sugar 5 lbs., fresh cream 1½ quarts, almonds, chopped, Barcelona nuts, glacé cherries, walnuts, chopped, of each ¼ lb., cream of tartar ¼ teaspoonful. Chop up the nuts and glacé cherries separately and lay them aside. Now put the sugar, cream and cream of tartar into a clean pan and boil to about 240° F. (not higher) and pour the syrup on a damp slab and let it get quite cold. Now use a spaddle and cream up by rubbing altogether against the slab. When all is creamed, cover with a damp cloth and let it remain for two hours. Now break off one pound of this cream and knead into it the chopped walnuts, into another pound the almonds, color another portion pink and knead the cherries into it. Color another pound brown and work in the Barcelona nuts. You should now have 1½ to 2 lbs. of the cream left. Divide this into two, color one part red and flavor with raspberry, and flavor the other part vanilla, but no coloring. As you finish each portion press them into frames which have been lined with wax paper, and roll them flat to about the thickness of a caramel. When set stiff cut with the caramel cutter.

Burnt almonds. White sugar 5 lbs., almonds 2½ lbs., water 2 pints, colors various, flavors various. Boil the sugar and water in the pan, and as soon as the mass boils, add the almonds which must be kept off the bottom by stirring until the degree of ball is reached. Now remove the pan from the fire, and with a spatula grain the boil by rubbing part of the syrup against the side of the pan until it gets thin and creamy. Then stir all together until it gets into a powder. Now turn into a coarse sieve, shake up well and separate those that adhere, and then divide the batch into three or four lots. Put one lot with its fair share of siftings into the pan, cover over the stove with a thin sheet of iron to break the heat, and put the pan on top of the iron. The siftings will gradually dissolve and adhere to the almonds, which will become crisp when done, which is ascertained by tasting. Turn the almonds out and treat the remainder the same way. They are often sold finished in this way, but in that case when the almonds have been put in the pan the second time, each lot should be colored and flavored differently and then mixed. If required crinkly, boil in another pan to high crack, 315° F., five pounds of white sugar. Put the almonds back into the pan, which must have been cleaned; pour over them this syrup in two lots, stirring each time. In the latter case color the syrup for variety.

Candied nuts. Take any quantity of nut kernels, filberts, walnuts, Brazil nuts, or almonds as preferred. Boil sufficient sugar with the usual proportions of cream of tartar and water to the degree of weak crack, say 300° F. Remove the pan from the fire and drop in the kernels, a few at a time. Lift them out with a long fork; lay them on tins or a cold iron pouring plate and allow them to remain till set, when they are ready. Some prefer to roast the kernels before candying, but this is a matter of taste.

Fondants.

Fondant cream for centres. White sugar 20 lbs., glucose 7½ lbs., water 2½ quarts. Boil the ingredients in a clean boiling pan to 240° F. Then remove the pan from the fire and pour the contents on a clean slab previously dampened with cold water, and let them remain until cold. Then with a wooden spatula commence to rub this syrup to and fro against the slab until the batch turns white and creamy. When thoroughly done to a mass let it remain undisturbed for an hour, then put it away for future use in an earthenware pan covered with a damp cloth.

Fondants for mixtures. White sugar 10 lbs., glucose 2½ lbs., water 3 pints, colors various, flavors various. Boil the sugar, glucose and water to a stiff ball, and pour out on a damp slab. Let stand till nearly cold and then work up with the spatula to a glossy cream. Divide the boil into as many portions as colors are wanted. Then melt the cream; color and flavor to fancy. Run the batch into starch trays impressed with small fancy moulds of different shapes. When the fondants are set, crystallize in cold syrup. Fondants for mixtures are made a trifle harder to prevent them from being crushed by the other sweets with which they are mixed.

Parisian chocolate bonbons. Fondant cream 5 lbs., almonds ½ lb., chocolate, vanilla. Warm the fondant cream, flavor with vanilla and run it in starch trays impressed with oblong shapes. Thoroughly roast and chop up the almonds and stir them into some melted sweet chocolate, mixing them thoroughly. Now coat the fondant centres by dipping, taking them out separately. When dry they are ready for sale.

Burnt almond chocolate. Roast and almost burn 4 lbs. of almonds and chop them up not too fine. Now melt a small portion of chocolate and stir in the chopped almonds, making a very thick paste; in fact stir in all the almonds you can. Then with the fingers or a fork lift out a little at a time and place it on wax paper in little heaps, and allow to set.

INDEX.

ACID drops, lemon, 42–44
  African cocoa, 141
Albert rocks, 55
Alexandra rocks, 55
Almond hardbake, 62, 63
  rock, English, 62
Almonds, to blanch, 184
American cocoa, 136
Aniseed drops, or cough drops, 49, 50
  lozenges, 104
Apple jelly, 89, 90
  marmalade or jam, 89
  paste for ornamenting, 128
    or cheese, 90, 91
Apricot paste or cheese, 90, 91
Ariba Guayaquil cocoa, 137, 138
Asiatic cocoa, 140

BAHIA cocoa, 139
  Balsam tolu lozenges, 105
Barley sugar drops, 45, 46
    lemon, 44, 45
Bath lozenges, 105
Berbice cocoa, 138
Black currant jam, 82
    jelly, 92
    lozenges, 105, 106
    paste or cheese 90, 91
    squares or cakes, 87
  jack, 63
Boiling rooms and workshops, 29–31
Bottled tart fruits, 93
Brandy balls, 58
Brazilian cocoa, 139
Brown acid, 63
Burnt almond chocolate, 191
    rock, or French rock, 47, 48
Burnt almonds, 64, 65, 188, 189
    real, 69, 70
Bull's eyes, small, 63
Butter scotch, 183
    Doncaster, 74

CAKES, sugar piping for, 117, 118
Cameroon cocoa, 141, 142
Candied nuts, 189, 190
Candies, 176–185
Candy pulling, 180, 181
Cappillaire, 96
Caracas cocoa, 137
Caramel sugar, to spin, 115, 116
Caramels, 173–176
Cayenne cocoa, 139
  lozenges, 106
Ceylon cocoa, 140, 141
Chalk lozenges, 105
Cherries in brandy, 129, 130
Cherry balls, 70
  cream candy, 178
  stones and rose buds, 68,69
  syrup, 128
Chocolate and other confections, 163–173
  bars, cream for, 168
  bonbons, Parisian, 191
  caramels, 173, 174
  cigars, 163
  cream bars, 169, 170
    drops, 171–173
    roll, 168, 169
  creams, cream for, 168
  eggs, 164
  figures, fruit, animals and other small objects, 164
  for dipping, 173
  ice cream, 122

Chocolate in boiled sugars, 73
  lozenges and pastilles, 166, 167
  manufacture of, 142–163
  mass, levigation of, 156–158
    trituration of, 154–156
  moulding of, 162, 163
  nougatines, 171
  removal of air from, and division of, 161, 162
  sweet, 167, 168
Clarifying sugar, 22–24
Clear balls, 58, 59
Clove, 63
Cocoa beans, cleansing and sorting of, 143, 144
    commercial sorts of, 135–142
    mixing different kinds of, 148, 149
    roasting of, 144–148
  mass, ground, mixing of, with sugar and spices, 153, 154
    sugar and spices, proportions for mixing, 158–160
    trituration of, 149–151
  varieties and characteristics of, 133–142
Cocoanut candy, 51
  caramels, 175, 176
  chips, crystallized, 52, 53
  hardbake, or eggs and bacon, 52
  ice, cream or paste, 48, 49
  paste, etc., to ice, 54
Coffee ice cream, 123
Coloring materials, 160
Colors and adulterations, 24–28
Coltsfoot rock, 101
Comfits, lozenges, etc., 96–98
  or pan goods, manufacture of, 108–113
Cough candy, 49
  drops, or aniseed drops, 49, 50
  lozenges, 100, 101
Cream candies, 176, 177
  candy, white, 180
  chips, 179, 180
  for chocolate creams or bars, 168
  small sticks, tablets, fruit, or figures filled with, 164
Crystallized goods, liqueur bonbons, etc., 76, 77
Crystallizing, imitation, 71
Currant water ice, 124

DAMSON paste or cheese, 90, 91
  Doncaster butter scotch, 74
Drying stoves, average degrees of heat of, 31

ECUADOR cocoa, 136, 137
  Eggs and bacon or cocoanut hardbake, 52
English almond rock, 62
Esmeraldas cocoa, 137
Essence, artificial fruit, 39–41
Essequibo cocoa, 138
Everton toffee, 53, 54

FISHES, 70
  Fondants, 190, 191
French pralines, 69, 70
  rock or burnt almond rock, 47, 48
Frozen custard, 121, 122
Fruit candy, 183, 184
  essences, artificial, 39–41
  syrups, 96
Fruits, bottled tart, 93
  juice of, without sugar, 93
  preserved, to crystallize, 80
  whole to preserve in syrup, 80, 81

GINGER candies, 64
  crystallized imitation, 61, 62
  lozenges, common, 100
  preserved, 83
  toffee, 73
Goods, adulterated, tests for, 94
  kind of, and how to make, 41, 42
Gooseberry jam, 82
Gum paste ornaments, 116, 117
  pastilles, etc., 78, 79

HAITI cocoa, 139
  Hand and machine goods, 31–34
Honey comb, 59, 60
Honeycomb candy, 182
  drops, 46
Horehound candy, 50
  or Montpellier drops, 50

Hygienic chocolate, 158

ICES, 119–121
  Imitation cream ice, 121, 122
    crystallizing, 71
    Indian corn, 72
Indian corn, imitation, 72
  cream candy, 178, 179
Ipecacuanha lozenges, 107

JAMS, pulp for, 92
  to keep, 86, 87
Java cocoa, 141
Jellies, to keep, 86, 87
Jujubes, pink or yellow, 79

LAVENDER lozenges, 107
  Lemon acid drops, 42–44
    barley sugar, 44, 45
    candies, 64
    chips, 129
    pastilles or drops, 67, 68
    peel, preserved, 84, 85
    water ice, 123
Lemons, whole, to preserve, 125
Liqueur almonds and comfits, 78
  bonbons, 77, 78
Long-life lozenges, 107, 108
Love rock, 60, 61
Lozenges, chocolate, 166, 167
  comfits, etc., 96–98
  medicated, 98, 99

MACHALA Guayaquil cocoa, 138
Machine and hand goods, 31–34
Maple caramels, 176
Maracuiba cocoa, 138
Marañon cocoa, 139
Marmalades, 88
Marshmallows, 187
Martinique cocoa, 140
Mints, common, mixing for, 99, 100
Mixtures, fondants for, 190, 191
Molasses candy, 181
    transparent, 183
  cocoanut, 182, 183
Montpellier or horehound drops, 50
Musk lozenges, 102–104

NELSON balls, 63
  Nougatines, 170, 171
Nougats, 185–187

OPERA cream caramels, 187, 188
Orange chips, 129
  peel, preserved, 84, 85
  quarters in barley sugar, 126
  water ice, 124
Oranges, whole, to preserve, 125

PAN goods or comfits, 108–112
  Paregoric lozenges, 106, 107
Paris nogat, 127
Parisian chocolate bonbons, 191
Pastilles, chocolate, 166, 167
Peanut candy, 182
Pear drops, 65, 66
Penny goods, 67
  sticks, 66, 67
Peppermint candies, 64
  candy, 184, 185
  pastilles or drops, 67, 68
Persian sherbet, 75
Pine-apple drops, 47
  water ice, 125
  whole, to preserve, 126
Plum paste or cheese, 90, 91
  puddings, imitation, 57, 58
Port au Prince cocoa, 139
Pralines, French, 69, 70
Preserved fruits, to crystallize, 80
  ginger, 83
  lemon peel, 84, 85
  orange peel, 84, 85
Puerto Cabello cocoa, 137

QUINCE marmalade or jam, 90
  Quinine lozenges, 108

RASPBERRY caramels, 175
  cream, 122
  drops, 65, 66
  jam, 81, 82
  jelly, 85
  rocks, 56
  squares or cakes, 87
  syrup, 127
  toffee, 74, 75
  vinegar, 8[illegible]
  water ice, 124

Red cocoanut ice, 51
  currant jam, 82
    jelly, 91, 92
Rhubarb lozenges, 107, 108
Rock varieties, 60, 61
Rose acid, 63
  buds and cherry stones 68, 69
  candies, 64
  drops, 65, 66
  lozenges, 101
  pastilles or drops, 67, 68

ST. DOMINGO cocoa, 140
  Seville orange marmalade, 88, 89
Shaking table, 164–166
Sherbet, Persian, 75
Soconusco cocoa, 136, 137
Spanish spiced chocolate, 159
Spiced chocolate, 158, 159
Spinning sugar, piping gum paste, ornaments, etc., 113, 114
Sponge candy, 182
  sugar, 59, 60
Sticks, 63
Strawberry cream, 122
  jam, 82, 83
  rocks, 56
  water ice, 124
Sugar, boiled, in moulds, 56
    to remove acids from, 94
  candy, pink and white, 72, 73
  clarifying of, 22–24
  cutting the grain of, lowering reducing or greasing, 37–39
  piping for cakes, 117, 118
Sugar, qualities of, 17–21
  to preserve without, 92
Sugars, boiled, as medals, etc., 57
    chocolate in, 73
  colored, 95, 96
  on the degree of boiling, and how to test them, 34–37
Surinam cocoa, 138
Sweet chocolate, 167, 168

TEA ice cream, 123
  Terra alba, detection of, 95
Tom Thumb drops, 70
Trinidad cocoa, 140
Turkey sugars, 66

VANILLA caramels, 174, 175
  chocolate, 159
  ice cream, 122
  nougat, 186, 187
Venezuelan cocoa, 136, 137
Victoria rocks, 55

WALNUT caramels, 176
  cream candy, 177, 178
  molasses candy, 181, 182
Water ices, 123–125
West Indian cocoa, 139
White acid 63
Workshop and boiling rooms, 29–31

YELLOW jack, 181

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